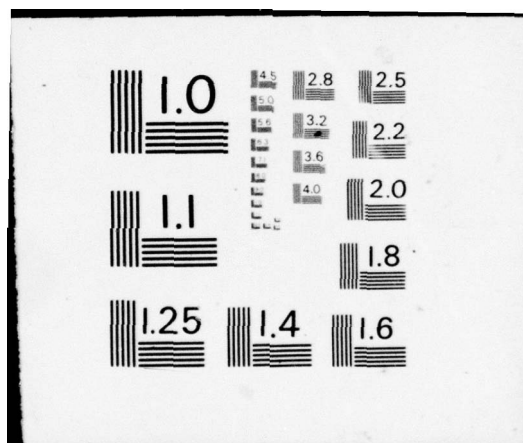


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UNITED STATES ARMY AVIATION TEST BOARD
Fort Rucker, Alabama 36362

STEBG-TD

11 12 SEP 1963

SUBJECT: Report of Test, USATECOM Project No. 4-3-3850-01-G,
Installation of Attitude and Directional Indicators in
OH-23D Helicopters

TO: Commanding General
US Army Test and Evaluation Command
ATTN: AMSTE-BG
Aberdeen Proving Ground, Maryland 21005

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1. References:

a. DF, Headquarters, USCONARC, 22 March 1962, subject:
"Sperry Electrical Instrument System," with Comment No. 2.

b. Report of Test, Project No. AVN 1962.1, "Evaluation of
Attitude and Directional Indicators for the H-13(1) Helicopters," US
Army Aviation Board, 12 March 1962.

c. Draft Modification Work Order (MWO), US Army Signal
Aviation Test and Support Activity (USASATSA) Project No. 29-62,
"Installation of Attitude and Directional Indicators in OH-23D Heli-
copters," 17 January 1963.

2. The feasibility of installing attitude and directional indicators
in OH-23 Helicopters was confirmed by the US Army Aviation Test
Board. A draft Modification Work Order (reference 1c) was prepared
and submitted to the US Army Signal Avionics Field Office, 17 January
1963, outlining the details of installation. This Modification Work
Order did not provide for illumination of the instrument panel.

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STEBG-TD

SUBJECT: Report of Test, USATECOM Project No. 4-3-3850-01-G,
"Installation of Attitude and Directional Indicators in
OH-23D Helicopters"

3. The attached draft Modification Work Order is a revision of the original and contains provisions for a panel with illuminated instruments, controls, switches, and their markings.

3 Incl

1. Draft MWO
2. Assembly Instructions
3. Equip Discrepancies
& Suggested Changes

for Stephen S. Schuty, Lt Col
A. J. RANKIN
Colonel, Armor
President

ACCESSION for	
WTIS	White Section <input checked="" type="checkbox"/>
DTC	Buff Section <input type="checkbox"/>
UNANNOUNCED	<input type="checkbox"/>
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(§) - Symbol indicates data to be provided by USAAFO, St. Louis, Mo.

MWO 55-(§) _____

DEPARTMENT OF THE ARMY DRAFT MODIFICATION WORK ORDER

INSTALLATION OF ATTITUDE AND DIRECTIONAL INSTRUMENTS
IN OH-23D HELICOPTERS

Department of the Army, Washington 25, D.C. (§) _____ 196 _____

Who will accomplish: Fourth echelon maintenance activities.

When to accomplish: As scheduled by fourth echelon maintenance activities.

Form entry: DA Form 2408-15 (Service Record for Aircraft); DA Form 2407 (Maintenance Request) (Section II); DA Form 2408-17 (Aircraft Inventory Record); AFTO 1-1B-40 or Specific Weight and Balance Appendix IV of the Organizational Maintenance Manual (-20).

Stocks affected: None.

Aircraft affected: The following helicopters will be modified by field activities in accordance with instructions herein:

Model

Serial No.

OH-23D

(§)

NOTE

This MWO is applicable
to the following aircraft:

<u>Model</u>	<u>Serial No.</u>
a. OH-23D	57-3078 and subsequent.
b. OH-23D	57-2982 through 57-3077, providing TM 1-1H-23D- 1005 has been complied with.

1. Purpose: To ^{THIS REPORT} provide instructions for installing the GH-211
Attitude Horizon Indicator and the RH-101 Heading Indicator in OH-23D
Helicopters.

2. Modification Data:

a. Removal Instructions:

NOTE

In complying with this Modification
Work Order, variations are permis-
sible provided the intent of the MWO
is accomplished.

NOTE

Steps marked with an asterisk (*)
indicate equipment to be retained
for reinstallation.

NOTE

Access doors, inspection panels,
and windshield assembly shall be
removed as necessary in accordance
with TM 1-1H-23D-2 during modifi-
cation.

NOTE

All hardware to be retained for re-installation should be loosely reinstalled in the mounting holes immediately upon removal of the affected item.

- (1) Disconnect aircraft battery.
- *(2) Remove battery from aircraft.
- *(3) Remove battery rack assembly by detaching the mounting hardware. (Retain hardware for reinstallation.)
- *(4) Remove doors.
- *(5) Remove lower windshield assembly (64004-101).
- *(6) Remove safety belts, seat cushion, and seat from the pilot's and passenger's positions.
- *(7) Remove access panels from left and right sides of the pedestal tunnel (circuit breaker panel).
- *(8) Remove the access plates located on the right side of the engine deck at Stations 76.5 and 98.0.
- *(9) Remove access plate located on right side of tailboom at T. C. Station 7.5.
- (10) Remove main instrument panel assembly (81260-9) as follows:
 - (a) Remove the upper plastic panel (81259-7D) from face of instrument panel by removing the caps from the eleven instrument lights, the INSTRUMENT LIGHTS knob (81288), and the four screws and washers which attach the plastic panel to the instrument panel. (Retain knob (81288), screws, and washers.)
 - (b) Release the seven Dzus fasteners securing the instrument panel to the pedestal, and swing the panel aft (open).

(c) Disconnect the safety strap from the instrument panel and the pedestal, and remove from aircraft.

(d) Disconnect the flexible hose from the airspeed indicator, altimeter, manifold pressure gage, and engine gage unit. Plug or cap the instruments and flexible lines until reinstallation.

(e) Disconnect the two electrical connectors and the mechanical tuning linkage (84074-21) from the C-1917/AR (UMF) Radio Control Unit.

(f) Disconnect the bonding strap (jumper assembly, MS25083-2AB4) from lower left side of instrument panel and the airframe, and remove from aircraft.

(g) Disconnect instrument panel harness assembly connector (SC06P-28-15P) from receptacle (SC00P-28-15S) inside the pedestal. (Cover receptacle to prevent dirt from entering.)

*(h) Disconnect connector (1-317-1) from the fuel quantity indicator. This cable is not a part of the instrument panel harness assembly and remains in the aircraft (pedestal) for reinstallation.

*(i) Remove the four screws which secure the magneto switch to the instrument panel. The magneto switch and attached wiring remain in aircraft (pedestal) for reinstallation. (Retain hardware.)

(j) Disconnect and remove Wires RF235C16, RU1210C14, RF325C16, and RU1205C18 from the instrument pedestal terminal block.

*(k) Remove the instrument panel (with indicators, switches, etc., still attached) from aircraft by removing the three screws and four rivets which secure the hinge to the instrument pedestal tunnel (circuit breaker panel). (Retain hardware.)

*(l) Remove carburetor air temperature indicator, tachometer, fuel quantity indicator, cylinder head temperature indicator, and the engine gage unit from the instrument panel by disconnecting electrical connectors and mounting screws. (Retain hardware.)

*(m) Disconnect tubing assembly (81291-56) that interconnects the airspeed indicator and altimeter, and remove the two instruments from instrument panel. (Retain hardware.)

*(n) Remove voltammeter, master switch, position light switch, and fuel gage test switch from instrument panel by disconnecting all attached wires and mounting hardware. (Retain hardware.)

*(o) Remove instrument lighting rheostat from instrument panel by unsoldering attached wires and removing mounting hardware. (Retain hardware.)

*(p) Remove the generator warning light and 100-ohm, 10-watt, wire-wound resistor by unsoldering attached wires and removing mounting hardware. (Retain hardware.)

*(11) Disconnect the two electrical connectors, the antenna coaxial cable, and the mechanical tuning linkage from the R-508/ARC Receiver, and remove receiver from aircraft.

*(12) Unclamp mechanical tuning linkage (84074-21) and remove from aircraft.

*(13) Remove pilot's and co-pilot's SB-329/AR Radio Signal Distribution Panels and SB-327/ARC-44 Radio Control Panel by disconnecting the electrical connectors (2Z3046.86) and releasing the Dzus fasteners.

(14) Remove the SA-474/AR Switch Assembly by disconnecting electrical connector (L655915-1) and releasing the Dzus fasteners.

(15) Remove the SA-474/AR Harness Assembly (84215-29) from aircraft as follows:

(a) Remove cover from the AN/ARC-44 Junction Box and disconnect the following wires: (Retain cover.)

<u>Disconnect Wire No.</u>	<u>From Terminal No.</u>
RF325E18	108
RF327A18	4

<u>Disconnect Wire No.</u>	<u>From Terminal No.</u>
RF323A18	29
RF223C18	10
RF235L18	42
RF208B18	3
RF235J18	42
RF235M18	27
RF235N18	28
RF235K18	42
RF400A22	24
RF245B22	43

(b) Free harness from existing wiring as necessary and remove from aircraft.

*(16) Remove UHF frequency card holder (AN5800-1-TC), if installed, from radio control panel support assembly (84233). (Retain hardware.)

(17) Remove 10 amp circuit breaker (MS25244-10) for the AN/ARC-44 (FM) from the circuit breaker panel as follows:

*(a) Remove the two mounting screws and six instrument light caps that secure the plastic lighting panel (81258-3) to the circuit breaker panel. (Retain caps and screws.)

*(b) Carefully remove the plastic lighting panel and remove FM circuit breaker from circuit breaker panel. (Retain plastic lighting panel.)

(c) Disconnect Wires RF235A16, P5G14, P5H14, and P5R16 from FM circuit breaker, and remove circuit breaker from aircraft.

(18) Remove AN/ARC-60 harness assemblies (84215-59) and (84215-61) from aircraft as follows:

*(a) Remove cover from the AN/ARC-60 (J-13A) Junction Box and disconnect the following wires: (Retain cover.)

<u>Disconnect Wire No.</u>	<u>From Terminal No.</u>
RU1100C20	1
RU1101C20	2
RU1102C20	3
RU1103C20	4
RU1104C20	17
RU1105C20	18
RU1106C20	19
RU1107C20	20
RU1165B20	7
RU1116B20	5
RU1140B20	6
RU1173B20	9
RU1115B20	21
RU1139B20	22
RU1108B20	10
RU1132B20	11
RU1111B20	26
RU1135B20	27

<u>Disconnect Wire No.</u>	<u>From Terminal No.</u>
RU1199A20N	Ground
RU1148B20	12
RU1174B20	13
RU1109E20	14
RU1206A20N	Ground

(b) Disconnect Wires RU1200B20, RU1203A20, and RU1205A20 from the instrument pedestal terminal block.

(c) Free the two harnesses from existing wiring as necessary and remove from aircraft.

b. Installation Instructions:

(1) Modification of Instrument Control Pedestal:

(a) Remove radio control panel support assembly (84233) (see Figure I-1) from the control pedestal by drilling out 16 attaching rivets.

(b) Remove the three Dzus receptacles (PRB 3-1/2) (see Figure I-1) from top of control pedestal by drilling out the six attaching rivets.

(c) Install Angle Support Bracket (Item 10) on instrument tunnel using the three screws previously removed from the instrument panel hinge.

(d) Temporarily attach two Dzus receptacles (PRB 3-1/2) to the Dzus fasteners (PF 3-1/2) located at top of new Instrument Panel Assembly (Item 8).

(e) Position instrument panel against the control pedestal and secure by closing bottom and side Dzus fasteners.

(f) With instrument panel secured in position, drill two No. 30 (0.128 inch diameter) holes in the top of the pedestal for

each Dzus receptacle, using the mounting holes in the two receptacles as a guide.

(g) Remove instrument panel from control pedestal and remove the two Dzus receptacles attached to the instrument panel in Step (d) above.

(h) Countersink the four holes, drilled in Step (f) above, from the top of the control pedestal to 0.218 inch diameter (100°), and install two Dzus receptacles (PRB 3-1/2) using four rivets (AN426AD4-6). (See Figure I-3.)

(i) Modify radio control panel support assembly (84233) removed in Step (a) above as follows:

1. Remove the center portion of the support assembly by drilling out the eight attaching rivets. (See Figure I-2.)

2. Using the holes vacated in Step (i)1. above as a guide, attach Support Assembly (Item 9) to the radio control panel support assembly (84233) using four rivets (AN426AD3-4), two rivets (AN470AD3-3), and two rivets (AN470AD4-6).

(j) Using holes vacated in Step (i)(a) above and 16 rivets (AN470AD4-4), reinstall the modified support assembly (84233) on the control pedestal.

(k) Install T. B. 1 terminal block (AN3436-2-7) inside the control pedestal as follows: (See Figure I-3.)

1. Draw a vertical line 3.75 inches left of the centerline of control pedestal.

2. Measure 1.5 inches down from the top of the control pedestal and drill a No. 31 (0.120 inch diameter) hole on the line drawn in Step 1. above.

3. Position terminal block on the vertical line drawn in Step 1. with the top mounting hole centered on the No. 31 hole drilled in Step 2. above.

4. Using the terminal block as a guide, drill a bottom mounting hole, using a No. 31 (0.120 inch diameter) drill.

5. Install terminal block using two screws (AN515DD440R6), two nuts (AN365D440A), two washers (AN960PD4L), one insulating strip (AN3434-1), and one buss bar (AN3433-2-3).

(1) Install grommet (AN931-8-13) in the existing 0.812 inch diameter hole in control pedestal located approximately 5.375 inches left of centerline of control pedestal, and approximately 6.625 inches down from top of control pedestal. (See Figure I-1.)

(2) Install Harness Assembly (Item 3) for the GH-211 Attitude Horizon Indicator as follows:

(a) Cut a 0.875 inch diameter hole in the top of the control pedestal 3.375 inches left of the centerline and 1.125 inches aft of the existing rivet line shown in Figure I-2.

(b) Insert receptacle (PT02E-12-10SW(SR)), which is attached to Harness Assembly (Item 3), into the 0.875 inch diameter hole (Step (a) above), and drill four No. 31 (0.120 inch diameter) mounting holes using the holes in the receptacle as a guide.

(c) Insert the receptacle (PT02E-12-10SW(SR)) into the 0.875 inch diameter hole from the top of the control pedestal and secure with four screws (AN515DD440R6), four nuts (AN365D440A), and four washers (AN960PD4L).

(d) Following existing cable, route Harness Assembly (Item 3) along the forward left side of the control pedestal (see Figure I-4) and down to the 0.812 inch diameter hole (see Figure I-1) in the control pedestal.

(e) Route the harness assembly through the 0.812 inch diameter hole and into the control pedestal, and connect the wires to the new terminal block (T.B. 1) as shown in wiring diagram (Figure I-15).

(f) The harness will be secured later during the modification.

(3) Install Harness Assembly (Item 5) for the RH-101 Heading Indicator as follows:

(a) Connect wires of Harness Assembly (Item 5) to the new terminal block (T.B. 1) located inside the control pedestal as shown in wiring diagram (Figure I-15).

(b) Secure harness assembly to the control pedestal (upper left corner) with one clamp (MS21919DG3) (see Figure I-3), using the existing mounting hole and hardware.

(4) Install Harness Assembly (Item 2) for the FM homing switch and FM squelch switch as follows:

(a) From inside the pedestal, route harness assembly through the existing grommet hole in the center of the control pedestal. (See Figure I-3.)

(b) Allow approximately 12 inches of the harness assembly to remain inside the control pedestal.

(c) Following existing wiring, route harness assembly to the left side of the control pedestal and into the AN/ARC-44 Junction Box located above the radio rack. (See Figure I-4.)

(d) Connect the wires of the harness assembly in the AN/ARC-44 Junction Box as follows:

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
RF208B18	3
RF327A18	4
RF223C18	10
RF323A18	29
RF235L18	42
RF325E18	108

(e) Install Wire RF235J16, part of Loose Wire Package (Item 14), in the AN/ARC-44 Junction Box between terminals 27 and 42.

(f) Secure wires installed in the AN/ARC-44 Junction Box with string-ties and replace cover on junction box.

(g) Temporarily secure the harness assembly to existing wiring. The wires will be permanently secured after all wires have been installed in the control pedestal.

(5) Install Mounting Bracket (Item 11) for the static inverter on the forward side of yoke assembly (84225-3) (see Figure I-5), part of the radio racks located at Station 13.75, as follows:

(a) Position the mounting bracket against the forward side of the yoke assembly with the mounting bracket centered on centerline of the aircraft and with the two top corner rivet holes 0.75 inch below the rack which supports the DY-107/AR Dynamotor. The two flanges on the mounting bracket must be turned aft. (See Figure I-5.)

(b) With mounting bracket held in place, drill eight No. 30 (0.128 inch diameter) holes in the yoke assembly.

(c) Secure mounting bracket to the yoke assembly with eight rivets (AN470AD4-4).

(6) Install static inverter (Sperry Type SI-111) on Mounting Bracket (Item 11) using four screws (AN515DD832R8), eight washers (AN960PD8), and four nuts (AN365D832A). The receptacle on the static inverter must be turned toward the left side of the aircraft. (See Figure I-5.)

(7) Install Harness Assembly (Item 6) for the static inverter as follows:

(a) Attach connector (PT06E-12-10S(SR)) to the static inverter.

(b) Route harness assembly around left side of the rack which supports the DY-107/AR Dynamotor, and secure to the left side of the rack with one clamp (MS21919DG4), one screw (AN515DD832R8), two washers (AN960PD8), and one nut (AN365D832A) (see Figure I-4), utilizing existing hole.

(c) Route the harness assembly along existing wiring (see Figure I-4) to the 0.812 inch diameter hole (see Figure I-1) leading into the control pedestal.

(d) Secure the harness assembly to the radio racks by replacing three existing clamps with one clamp (MS21919DG6) and two clamps (MS21919DG7). Utilize existing hardware. (See Figure I-4.)

(e) Route all wires of the harness assembly, except Wire V1A22, into the control pedestal through the 0.812 inch diameter hole, and connect to new terminal block (T.B. 1) as shown in wiring diagram (Figure I-15).

(f) Route Wire V1A22 along existing wiring through grommet hole at Station 27.50 and aft to the receptacle (SC00P-28-15S) at Station 31.50 in control pedestal tunnel. (See Figure I-6.)

(g) Locate Spare Wire T-16 in receptacle (SC00P-28-15S) and connect Wire V1A22 to Spare Wire T-16 with one red splice connector (AMP No. 320559). (See wiring diagram, Figure I-15.)

(h) Secure Wire V1A22 to existing wiring with string-ties as required.

(8) Install ground wire marked GND-16, part of Loose Wire Package (Item 14), as follows:

(a) Locate Spare Wire d-16 in receptacle (SC00P-28-15S) (see Figure I-6) and connect to GND-16 with one red splice connector (AMP No. 320559).

(b) Route Wire GND-16 to the right side of the bulkhead at Station 31.50 in the instrument pedestal tunnel.

(c) Connect Wire GND-16 to the bulkhead (utilize existing hole) using one screw (AN515DD832R8), three washers (AN960PD8), and one nut (AN365D832A). NOTE: Use a bonding brush to insure proper grounding. (See Figure I-6.)

(9) Install Harness Assembly (Item 1) for the Remote Directional Gyro (Sperry Type DG-411) as follows:

(a) Cut a 1.0 inch diameter hole in the right side of engine deck at Station 103.0 and B.L. 15. (See Figure I-8.)

(b) Insert receptacle (PT02E-14-19S(SR)), part of Harness Assembly (Item 1), into the 1.0 inch diameter hole cut in Step

(a) above, and drill four No. 31 (0.120 inch diameter) mounting holes, using the receptacle mounting holes as a guide.

(c) Insert receptacle (PT02E-14-19S(SR)) into the 1.0 inch diameter hole from underside the engine deck and secure with four screws (AN515DD440R6), four nuts (AN365D440A), and four washers (AN960PD4L).

(d) Route harness assembly forward and through the lightening holes in the right side of the bulkheads at Stations 95.38, 84.25, 74.0, and 62.0 beneath the engine deck. Tie to the existing harness and secure by replacing existing clamps at Stations 95.38, 84.25, 74.0, and 62.0 as shown in Figure I-10.

(e) Following existing cable, route harness forward from Station 62.0 to the grommet hole at Station 44.75, B.L. 0.62. (See Figure I-11.)

(f) Tie harness to the existing harness between Stations 62.0 and 44.75 and secure by replacing two existing clamps with two clamps (MS21919DG9), using existing mounting hardware. (See Figure I-11.)

(g) Following existing cables, route harness through the bulkhead grommet holes at Stations 44.75, 39.25, 35.25, 31.50, and 27.50. String-tie as required. Replace existing clamp at Station 30.0 with one clamp (MS21919DG9), using existing hardware. (See Figure I-6.)

(h) Route harness assembly along existing wiring to the 0.812 inch diameter hole in the pedestal (see Figure I-1). Secure with string-ties as required.

(i) Route harness assembly through the 0.812 inch diameter hole into the control pedestal and connect to the new terminal block (T.B. 1) as shown in wiring diagram (Figure I-15).

(10) Install Support Bracket (Item 13) for the Remote Directional Gyro (Sperry Type DG-411) on right side of the tailboom assembly as follows:

(a) Remove the sixteen existing rivets shown in Figure I-8.

(b) Place the support bracket on the tailboom assembly with the front flange flush with the leading edge of the skin on the tailboom, and with the left and right flanges of the support bracket over the rivet holes vacated in Step (a) above.

(c) Holding the support bracket in place, drill sixteen No. 30 (0.128 inch diameter) rivet holes in the support bracket by back-drilling through the sixteen rivet holes vacated in Step (a) above.

(d) Secure the support bracket to the tailboom assembly with 12 rivets (AN470AD4-5), 2 rivets (AN470AD4-7), and 2 rivets (AN470AD4-8). (See Figure I-9.)

(11) Install Remote Directional Gyro (Sperry Type DG-411) on Support Bracket (Item 13) as follows:

(a) Place DG-411 Gyro on the support bracket with the cable connector forward and secure to the mounting bracket with four washers (AN960PD10) and four nuts (AN365D1032A).

(b) Attach connector (PT06P-14-19P) to receptacle (PT02E-14-19S(SR)) previously installed on the engine deck.

(c) Secure the cable harness for the DG-411 Gyro to the support bracket with one clamp (MS21919DG4), one screw (AN515DD832R8), two washers (AN960PD8), and one nut (AN365D832A). (See Figure I-9.)

(12) Install Ground Wire RN3019A22N, part of Loose Wire Package (Item 14), as follows:

(a) Connect Wire RN3019A22N to Terminal No. 1 of the new terminal block (T.B. 1) located in the control pedestal.

(b) Route Wire RN3019A22N through the 0.812 inch diameter grommet hole (see Figure I-1) and connect to airframe ground on left side of radio rack, using one screw (AN515DD832R8), three washers (AN960PD8), and one nut (AN365D832A). Utilize existing hole. (See Figure I-4.)

(13) Install terminal block cover (397-7) on new terminal block (T.B. 1).

(14) Install new circuit breaker, ten amp, (MS24509-10) for the AN/ARC-44 (FM) in the circuit breaker panel as follows:

(a) Connect Wires P5G14, P5H14, and P5R14 to the forward (buss) side of the new 10 amp circuit breaker.

(b) Connect Wire RF235A16 to the aft (load) side of the new 10 amp circuit breaker.

(c) Remove mounting hardware from the neck of the circuit breaker; insert circuit breaker through hole vacated by removal of the original FM circuit breaker and secure with attaching hardware.

(15) Install Wires V1D22 and V1E22, part of Loose Wire Package (Item 14), as follows:

(a) Locate Spare Wire Y-16 in receptacle (SC00P-28-15S) just forward of Station 31.50 and connect one end of Wire V1D22 to Spare Wire Y-16 with one red splice connector (AMP No. 320559).

(b) Locate Spare Wire G-16 in receptacle (SC00P-28-11S) at Station 31.50 and connect it to the loose end of Wire V1D22 with one red splice connector (AMP No. 320559). (See wiring diagram, Figure I-15.)

(c) Locate Spare Wire G-16 in connector (SC06P-28-11P) at Station 31.50 and connect Wire V1E22 to Spare Wire G-16 with one red splice connector (AMP No. 320559). (See wiring diagram, Figure I-15.)

(d) Route Wire V1E22 to the existing (5 amp) FM homing circuit breaker and connect. (See wiring diagram, Figure I-15.)

(e) Secure Wires V1D22 and V1E22 to existing cable with string-ties.

(16) Reinstall Plastic Lighting Panel (81258-3) on circuit breaker panel and secure with the two screws and six instrument light caps previously removed.

(17) Install Harness Assembly (Item 7) for the C-1917/AR (UHF) Radio Control Unit as follows:

(a) Reinstall the C-1917/AR UHF **Radio Control Unit** in the lower center portion of the radio control panel support assembly and secure by closing the four Dzus fasteners.

(b) Attach connectors (A.R.C. 14320 and A.R.C. 14050), part of Harness Assembly (Item 7), to the C-1917/AR Control Unit, and route the harness to the left side of the control pedestal.

(c) Following existing wiring, route Wires RU1200B20, RU1203A20, and RU1205A20 of the harness assembly downward to the grommet hole located in the center of the control pedestal. (See Figure I-3.)

(d) Route Wires RU1200B20, RU1203A20, and RU1205A20 into the control pedestal and connect to the control pedestal terminal block as follows: (See Figure I-16.)

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
RU1200B20	1
RU1203A20	2
RU1205A20	5

NOTE

Reference TM 1-1H-23D-2, Pages
13-26, Figures 13-25.

(e) Following existing wiring, route remaining wires downward and into the AN/ARC-60 Junction Box (J-13A) and connect as follows:

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
RU1100C20	1
RU1101C20	2
RU1102C20	3
RU1103C20	4

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
RU1104C20	17
RU1105C20	18
RU1106C20	19
RU1107C20	20
RU1165B20	7
RU1116B20	5
RU1140B20	6
RU1173B20	9
RU1115B20	21
RU1139B20	22
RU1108B20	10
RU1132B20	11
RU1111B20	26
RU1135B20	27
RU1199A20N	Ground
RU1148B20	12
RU1174B20	13
RU1109E20	14
RU1206A20N	Ground

(f) Secure the wires in the J-13A with string-ties and replace the cover on the Junction Box.

(g) Tie harness to existing wiring and secure by replacing three existing clamps with two clamps (MS21919DG14) and one clamp (MS21919DG12), using existing hardware. (See Figure I-4.)

(18) Reinstall the R-508/ARC Receiver, and attach the two connectors (A.R.C. No. 14051) and antenna coaxial cable to the receiver.

(19) Reinstall mechanical tuning linkage (84074-21) between the C-1917/AR UHF Control Unit and the R-508/ARC Receiver as follows:

(a) Remove 90° adapter (MX-22/ARC-2) from mechanical tuning linkage and connect one end of tuning linkage to the R-508/ARC Receiver.

(b) Route mechanical tuning linkage to the top corner of the control pedestal and across the top of the pedestal to the C-1917/AR UHF Control Unit. Attach tuning linkage to the C-1917/AR Control Unit.

NOTE

Align the C-1917/AR Control Unit with the R-508/ARC Receiver.

(c) Secure the mechanical tuning linkage to the top of the control pedestal as follows: (See Figure I-17.)

1. Locate the rivet line on top of control pedestal and remove the first and fifth rivets to the right of centerline. (See Figure I-17.) Enlarge the two vacated rivet holes to a 0.166 inch diameter using a No. 19 drill.

2. Using the two holes enlarged in Step 1. above, secure mechanical linkage using two clamps (MS21919DG6), two screws (AN515DD832R8), four washers (AN960PD8), and two nuts (AN365D832A). (See Figure I-17.)

(20) Reinstall pilot's and co-pilot's SB-329/AR Radio Signal Distribution Panels and the SB-327/ARC-44 Radio Control Panel. Attach existing connectors.

NOTE

Install the SB-327/ARC-44 in the top center section of the radio control panel support.

(21) Reinstall UHF frequency card holder (AN5800-1-TC) on the left side of the radio control panel support using existing hardware. (See Figure I-4.)

(22) Install Spacer (Item 17) and Shim (Item 16) on the front side (inside) of the new Instrument Panel Assembly (Item 8) as follows:

(a) Align spacer and shim over the two top center instrument cutouts in the instrument panel with spacer next to the panel.

(b) Secure spacer and shim to the instrument panel with ten rivets (AN426AD3-7).

(23) Install Mounting Bracket (Item 12) on front side (inside) of new Instrument Panel Assembly (Item 8), using two screws (AN507B632R6), two washers (AN961-6), and two nuts (AN365B632C). (See Figure I-12.)

(24) Install terminal block (AN3436-2-5) on mounting bracket, using two screws (AN515DD440R6), two washers (AN960PD4L), two nuts (AN365D440A), one insulating strip (AN3434-1), and one buss bar (AN3433-2-3). (See Figure I-12.)

(25) Install the 100-ohm, 10-watt, wire-wound resistor previously removed, on Mounting Bracket (Item 12) using existing mounting hardware and the predrilled mounting hole in leg of Mounting Bracket.

(26) Install the following original equipment on the new instrument panel using existing mounting hardware: (See Figure I-13.)

Airspeed Indicator

Generator Warning Light

Altimeter

Position Light Switch

Tachometer

Fuel Gage Test Switch

Engine Gage Unit	Master Switch
Manifold Pressure Gage	Cylinder Head Temperature Indicator
Clock	Carburetor Air Temperature Indicator
Fuel Quantity Indicator	Voltammeter
Instrument Lighting Rheostat	

(27) Install new circuit breaker, two amp, (MS25244-2) for LOH System on new instrument panel. (See Figure I-13.)

(28) Install RH-101 Heading Indicator on new instrument panel (see Figure I-13) using one instrument mounting clamp (Aeroquip Corp., Los Angeles 64, California, Part No. 52981) and four screws (AN507B832R20).

(29) Install GH-211 Attitude Horizon Indicator on new instrument panel (see Figure I-13) using one instrument mounting clamp (Aeroquip Corp., Los Angeles 64, California, Part No. 52981) and four screws (AN507B832R20).

NOTE

The GH-211 and RH-101 Indicators must be mounted flush with the face of the instrument panel.

(30) Install Harness Assembly (Item 4) on the new instrument panel as follows: (See Figure I-12.)

(a) Attach connectors to the instruments as follows: (See wiring diagram, Figure I-16.)

<u>Attach Connector</u>	<u>To Instrument</u>
SC06P-14S-2S	Carburetor Air Temperature Indicator
SC06P-10SL-3S	Cylinder Head Temperature Indicator
SC06P-14S-7S	Tachometer (Rotor)

Attach ConnectorTo Instrument

SC06P-14S-7S

Tachometer (Engine)

UD-6-11

Fuel Quantity Indicator

SC06P-14S-2S

Engine Gage

(b) Connect Wires L1D18 and L3A18 to the position light switch. (See wiring diagram, Figure I-16.)

(c) Connect Wires V1B22 and V1C22 to the circuit breaker, two amp, (MS25244-2). (See wiring diagram, Figure I-15.)

(d) Connect Wires P11D20, P12A20N, P13D18, and P14A18 to the master switch. (See wiring diagram, Figure I-16.)

(e) Connect Wires D1C20, D1E20, D1F20, D2A20N, D3A20, and D4A20 to the voltammeter. (See wiring diagram, Figure I-16.)

(f) Solder Wires D5A20 and D6A20N to the 100-ohm, 10-watt, wire-wound resistor. (See wiring diagram, Figure I-16.)

(g) Solder Wires D1D20, D5A20, D5B20, and D7A20N to the generator warning light. (See wiring diagram, Figure I-16.)

(h) Solder Wires L1E18, L4A18, and L4P18 to the instrument lighting rheostat. (See wiring diagram, Figure I-16.)

(i) Solder Wires E9A20 and E9B20 to the fuel gage test switch. (See wiring diagram, Figure I-16.)

(j) Connect wires to the instrument panel terminal block (AN3436-2-5) as follows: (See wiring diagram, Figure I-16.)

Connect Wire No.To Terminal No.

L4A18

1

RU1205C18

1

L1C18

2

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
L1D18	2
L1E18	2
D2A20N	3
D6A20N	3
D7A20N	3
E3A20N	4
E5A20N	4
E10A20N	4
E12A20N	4
P12A20N	5
Ground-16	5

(31) Install terminal block cover (397-5) on new instrument panel terminal block.

(32) Replace tee fitting (AN825-4D) on the altimeter with a 45° Elbow (AN823-4D).

(33) Replace union (AN815-4D) that connects flexible hose assembly (AN6270-4-13) from the altimeter to the pitot static pressure line (81291-90) in the control pedestal as follows:

(a) Disconnect static pressure flexible hose assembly (AN6270-4-13) and union (AN815-4D) from static pressure line (81291-90). (Retain the flexible hose.)

(b) Install tee fitting (AN824-4D) in the static pressure line (81291-90).

(c) Install flexible hose removed in Step (a) above on the tee fitting installed in Step (b) above.

(d) Install new flexible hose assembly (AN6270-4-10) on the remaining connection of the tee fitting installed in Step (b) above.

(34) Replace existing flexible hose assembly (AN6270-4-13) marked "Manifold Pressure" with flexible hose assembly (AN6270-4-10).

(35) Install the instrument panel as follows:

(a) Place the instrument panel near the opening in the control pedestal.

(b) Install the magneto switch on the instrument panel using existing mounting hardware. (See Figure I-14.)

(c) Install the FM homing switch and FM squelch switch on the instrument panel, using the hardware supplied with the switches. (See Figure I-14.)

(d) Connect shielded cable connector (1-317-1) (see Figure I-1) to the fuel quantity indicator.

(e) Connect wires to control pedestal terminal block as follows: (See wiring diagram, Figure I-17.)

<u>Connect Wire No.</u>	<u>To Terminal No.</u>
RU1210C14	2
RF235C16	3
RF325C16	4
RU1205C18	5

(f) Install terminal block cover (3976) on the control pedestal terminal block.

(g) Connect flexible hose assembly (AN6270-4-13) marked "Fuel" to the fuel receptacle on the engine gage unit.

(h) Connect flexible hose assembly (AN6270-4-13) marked "Lubrication" to the oil receptacle on the engine gage unit.

(i) Connect flexible hose assembly (AN6270-4-13) marked "Pitot Pressure" to the airspeed indicator.

(j) Connect flexible hose assembly (AN6270-4-13) marked "Pitot Static," installed in Step (33)(c), to the static side of the airspeed indicator.

(k) Connect new flexible hose assembly (AN6270-4-10), installed in Step (33)(d) above, to the altimeter.

(l) Connect new flexible hose assembly (AN6270-4-10), installed in Step (34) above, to the manifold pressure gage.

(m) Attach connector (PT06E-14-19SX(SR)), part of Harness Assembly (Item 5), installed in Step b. (3) above, to the RH-101 Heading Indicator.

(n) Attach connector (PT06E-12-10PW(SR)), of the GH-211 Attitude Horizon Indicator, to receptacle (PT02E-12-10SW(SR)) installed in Step b. (2) above.

(o) Secure the instrument panel to the control pedestal by closing the seven Dzus fasteners.

(p) Install lighting panel (Item 15) using screws and washers retained in Step 2. (10)(a) above. (See Figure I-18.)

(36) Reinstall all inspection coverplates removed for accessibility during modification.

(37) Reinstall battery rack assembly and battery.

(38) Reinstall lower windshield assembly (64004-101).

(39) Reinstall safety belts, seat cushion, and seat in pilot's and passenger's positions.

(40) Reinstall doors.

(41) Apply power and check all systems for proper operation. If any system fails to function properly, troubleshoot in accordance with appropriate maintenance manuals.

3. Supply Data:

a. Parts required per aircraft:

(1) The following kit will be furnished upon instructions from the United States Army Avionics Field Office, ATTN: SELVL-C, 12th and Spruce Streets, St. Louis 2, Missouri.

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
	To be assigned (TBA)	Kit, Installation of Attitude and Directional Indicators in OH-23D (H-23D) Helicopters	1

This kit consists of:

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
1.	TBA	Assembly, Harness	1
2.	TBA	Assembly, Harness	1
3.	TBA	Assembly, Harness	1
4.	TBA	Assembly, Harness	1
5.	TBA	Assembly, Harness	1
6.	TBA	Assembly, Harness	1
7.	TBA	Assembly, Harness	1
	4720-200-0414	Assembly, Hose, Flexible, AN6270-4-10	2
8.	TBA	Assembly, Instrument Panel	1
9.	TBA	Assembly, Support	1
10.	TBA	Bracket, Angle Support	1
11.	TBA	Bracket, Mounting	1
12.	TBA	Bracket, Mounting	1

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
13.	TBA	Bracket, Support	1
	NSN	Bracket, TA102C-HD2-7-12	3
	6150-263-0654	Buss Bar, AN3433-2-3	2
	5925-713-8349	Circuit Breaker, 10 amp, MS24509-10	1
	NSN	Circuit Breaker, 2 amp, MS25244-2	1
	NSN	Clamp, Instrument Mounting (Aeroquip Corp., Los Angeles 64, California, Part No. 52981)	2
	5340-205-6300	Clamp, MS21919DG3	1
	5340-205-6301	Clamp, MS21919DG4	2
	5340-597-9514	Clamp, MS21919DG6	3
	5340-598-0592	Clamp, MS21919DG7	2
	5340-598-0597	Clamp, MS21919DG8	2
	5340-598-9864	Clamp, MS21919DG9	4
	5340-141-6999	Clamp, MS21919DG10	1
	5340-598-0208	Clamp, MS21919DG12	1
	5340-598-9803	Clamp, MS21919DG14	2
	NSN	Cover, Terminal Block, 397-5	1
	NSN	Cover, Terminal Block, 397-6	1
	NSN	Cover, Terminal Block, 397-7	1
	4730-186-9951	Elbow, 45°, AN823-4D	1

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
	5325-249-6351	Grommet, AN931-8-13	1
	5340-343-3452	Insulating Strip, AN3434-1	2
14.	TBA	Loose Wire Package	1
15.	TBA	Lighting Panel	1
	5310-595-7443	Nut, AN365B632C	2
	5310-281-9845	Nut, AN365D440A	12
	5310-282-7843	Nut, AN365D832A	11
	5310-197-2320	Nut, AN365D1032A	4
	NSN	Receptacle, Dzus, PRB 3-1/2	2
	5320-117-6938	Rivet, AN426AD3-4	4
	5320-117-6941	Rivet, AN426AD3-7	10
	5320-117-6951	Rivet, AN426AD4-6	4
	5320-117-6814	Rivet, AN470AD3-3	2
	5320-117-6815	Rivet, AN470AD3-4	6
	5320-117-6826	Rivet, AN470AD4-4	24
	5320-117-6827	Rivet, AN470AD4-5	12
	5320-117-6828	Rivet, AN470AD4-6	2
	5320-117-6829	Rivet, AN470AD4-7	2
	5320-117-6830	Rivet, AN470AD4-8	2
	5305-144-3950	Screw, AN507B632R6	2
	NSN	Screw, AN507B832R20	8

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
	NSN	Screw, AN515DD440R6	12
	NSN	Screw, AN515DD832R8	14
16.	TBA	Shim	1
17.	TBA	Spacer	1
	NSN	Splice Connector, AMP No. 320559	5
	4730-279-0872	Tee Fitting, AN824-4D	1
	5940-500-8033	Terminal Block, AN3436-2-5	1
	5940-500-8036	Terminal Block, AN3436-2-7	1
	5310-187-2397	Washer, AN960PD4L	12
	5310-187-2371	Washer, AN960PD8	27
	5310-183-4406	Washer, AN960PD10	4
	5310-297-4043	Washer, AN961-6	2

(2) The following GFAE parts required to comply with this Modification Work Order are not furnished in the kit and therefore will be requisitioned through normal supply channels:

<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
NSN	Remote Directional Gyro (Sperry Type DG-411)	1
NSN	Static Inverter (Sperry Type SI-111)	1
NSN	Heading Indicator (Sperry Type RH-101)	1
NSN	Attitude Horizon Indicator (Sperry Type GH-211)	2

b. Action required on items in stock: Not applicable.

c. Parts required to modify items in stock: Not applicable.

d. Disposition of removed parts: This part will be returned to stock if repairable or serviceable (refer to AR 735-11, paragraphs 7.b. and 7.c.):

<u>Federal Stock</u> <u>Number</u>	<u>Nomenclature or Description</u>	<u>Quantity</u> <u>(ea)</u>
5930-342-6074	Switch Assembly, SA-474/AR	1

e. Size and weight of parts kit:

<u>Size</u>	<u>Weight</u>
(§)	(§)

4. Kit Installation Tools: Tools available at fourth echelon maintenance shops are adequate.

5. Manhours Required: Approximately 80 manhours and a minimum crew of two men will be required per aircraft to accomplish this modification. This includes the time required to gain access to the work area.

6. Weight and Balance Information:

a. Change in basic weight: +15.13 pounds

b. Moment Arm: 68.2 inches

c. Change in basic moment: +1032.0 inch-pounds

d. Chart "A" Entry: DELETE

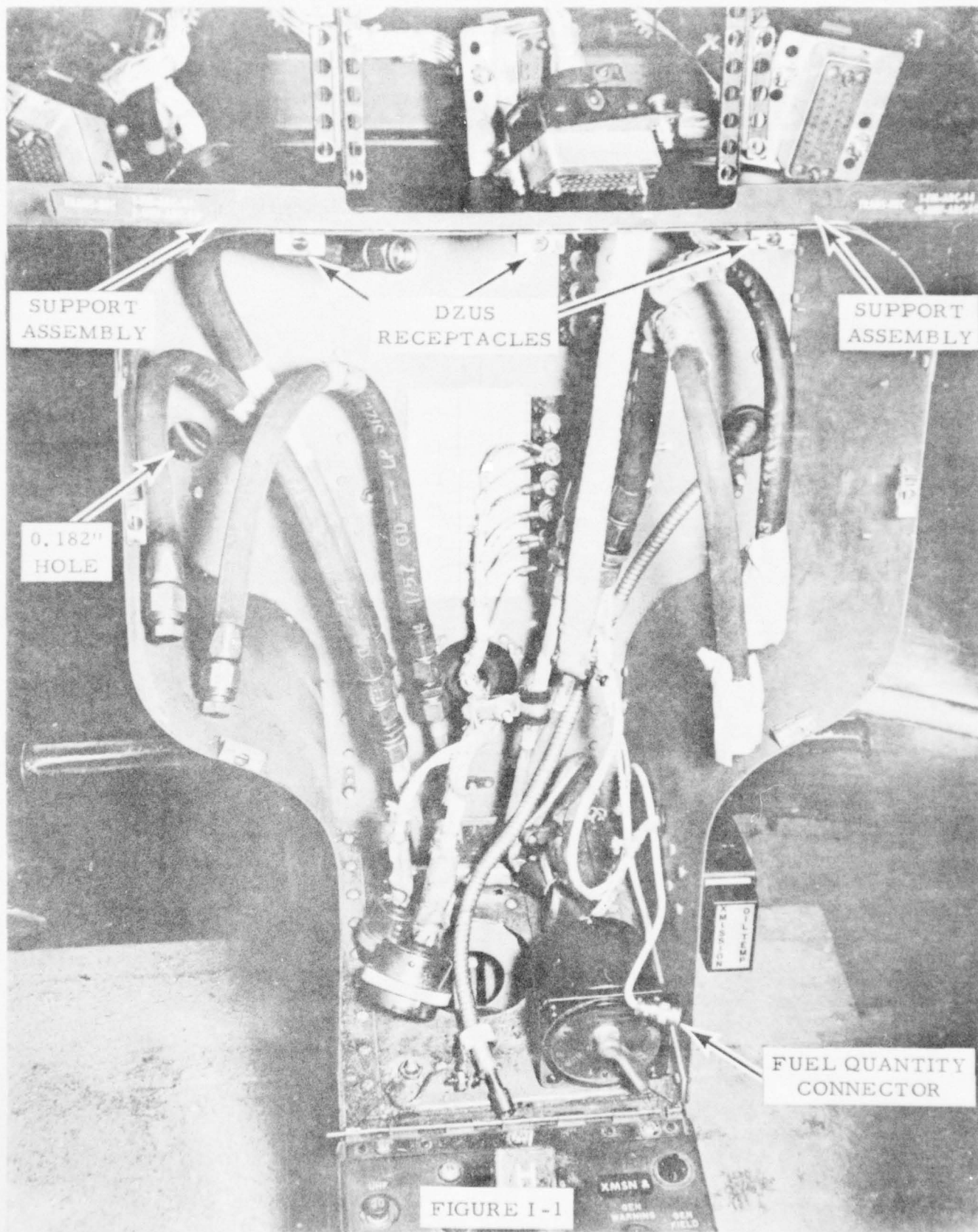
<u>Compartment</u>	<u>Item</u>	<u>Weight</u> <u>(lbs)</u>	<u>Arm</u> <u>(ins)</u>	<u>Moment/100</u> <u>(in-lbs)</u>
A	Switch Assembly SA-474/AR	0.75	25	0.19

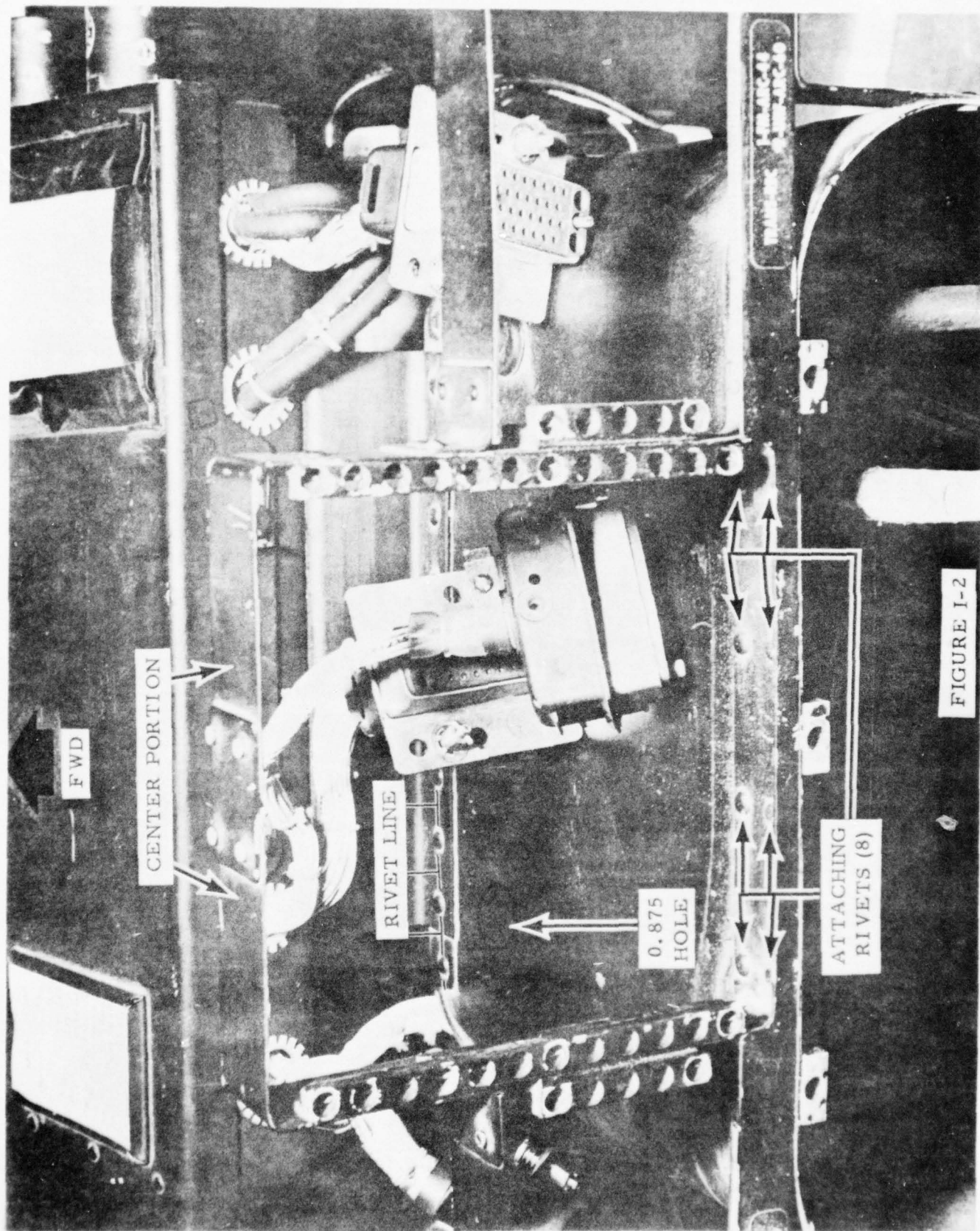
e. Chart "A" Entry: ADD

<u>Compartment</u>	<u>Item</u>	<u>Weight</u> <u>(lbs)</u>	<u>Arm</u> <u>(ins)</u>	<u>Moment/100</u> <u>(in-lbs)</u>
C	DG-411 Remote Directional Gyro	2.68	112	3.0
A	GH-211 Attitude Horizon Indicator	3.0	25	0.75
A	RH-101 Heading Indicator	1.5	25	0.38
A	SI-111 Static Inverter	1.7	12	0.2

f. Chart "C" Entry:

<u>Weight Change</u>	<u>Moment Arm</u>	<u>Moment/100</u>
+15.13 pounds	68.2 inches	+10.32 inch-pounds





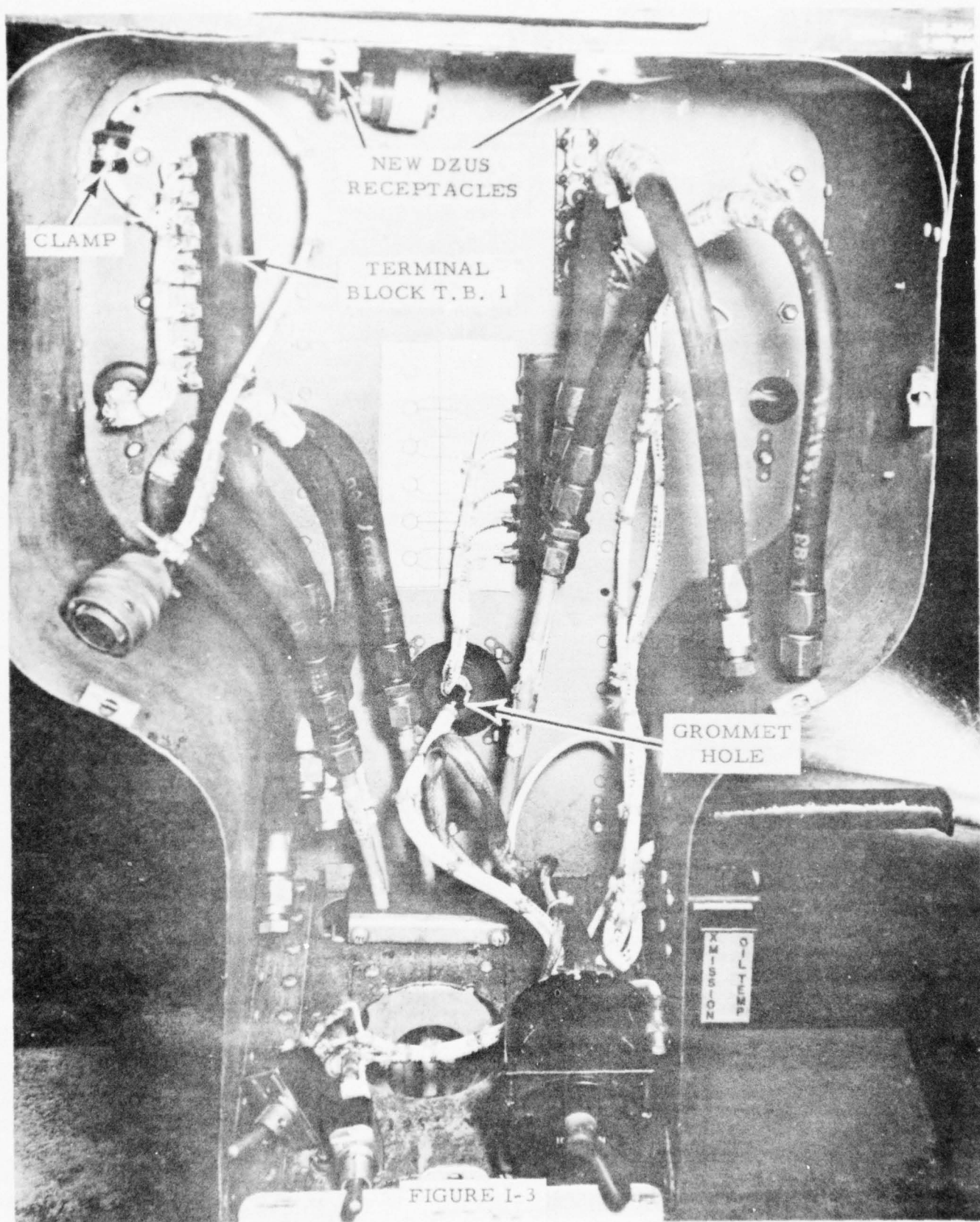
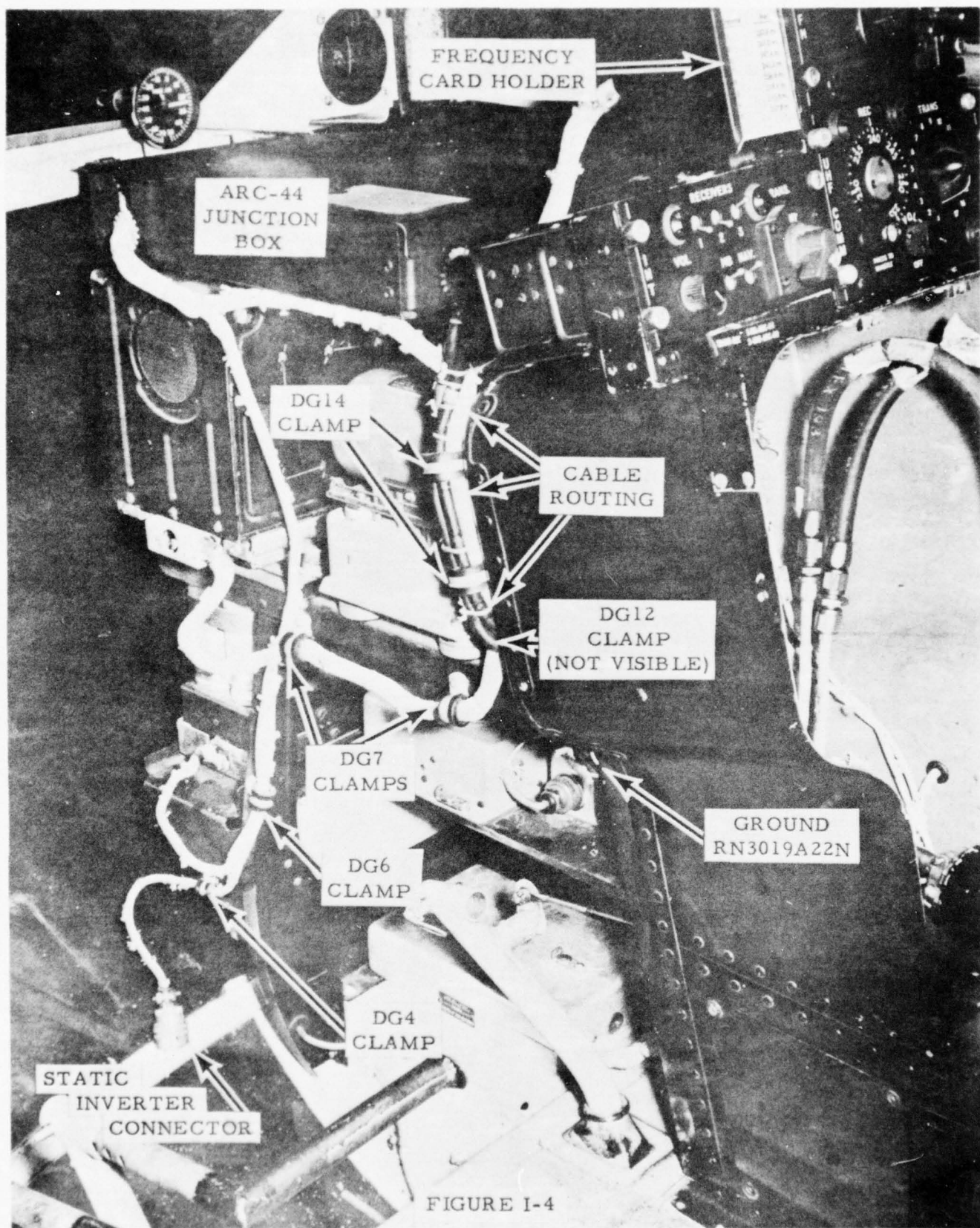
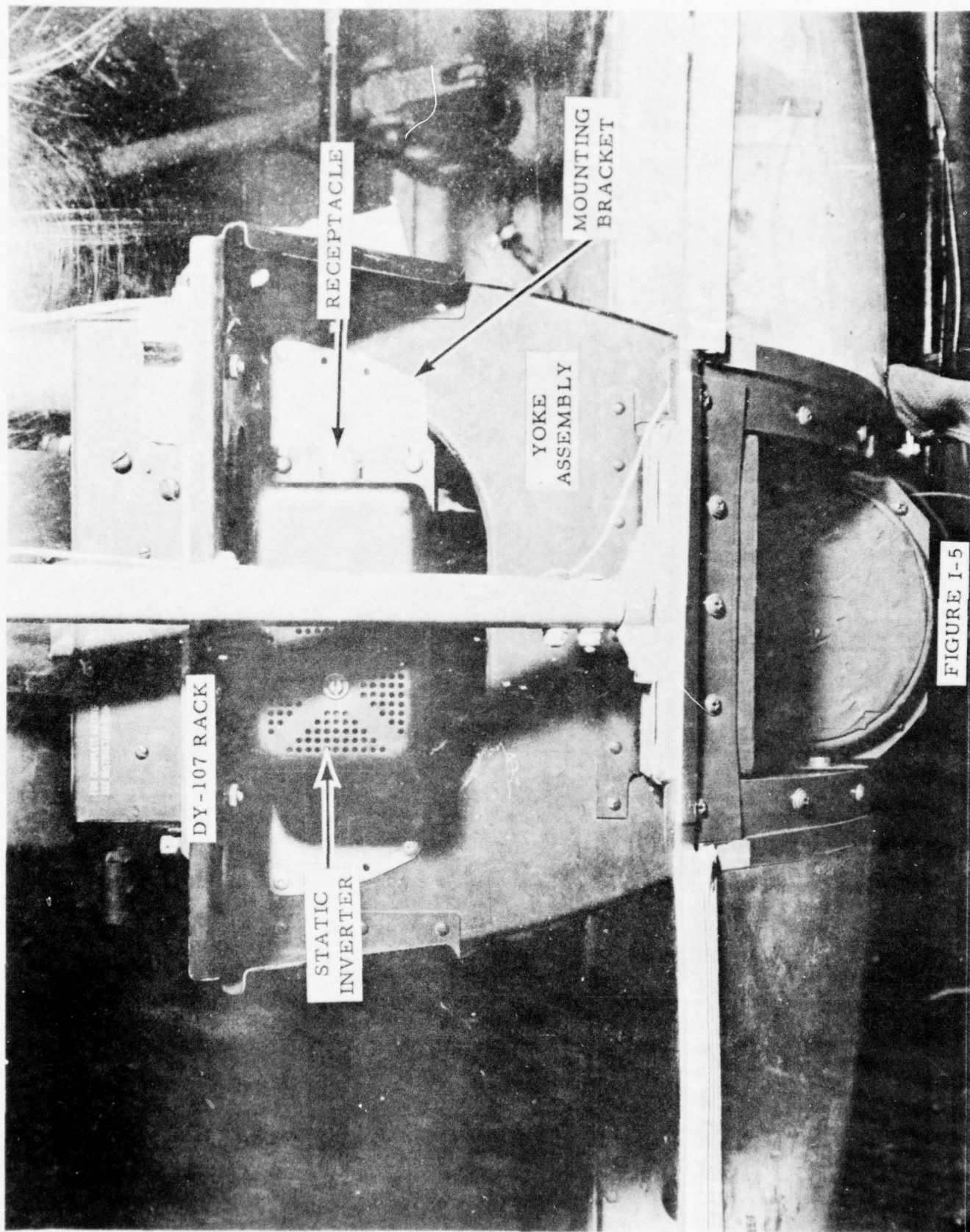


FIGURE I-3





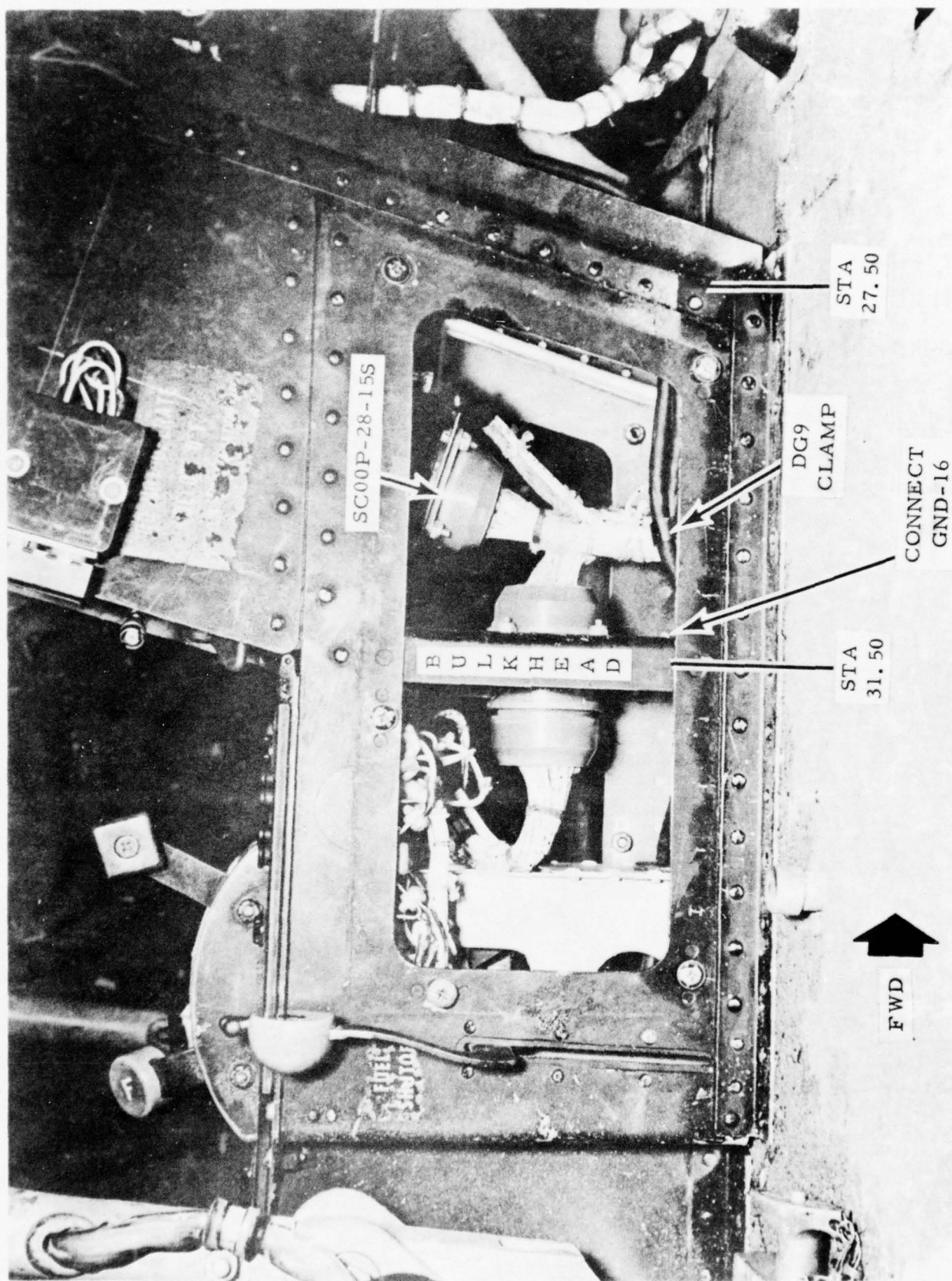


FIGURE I-6

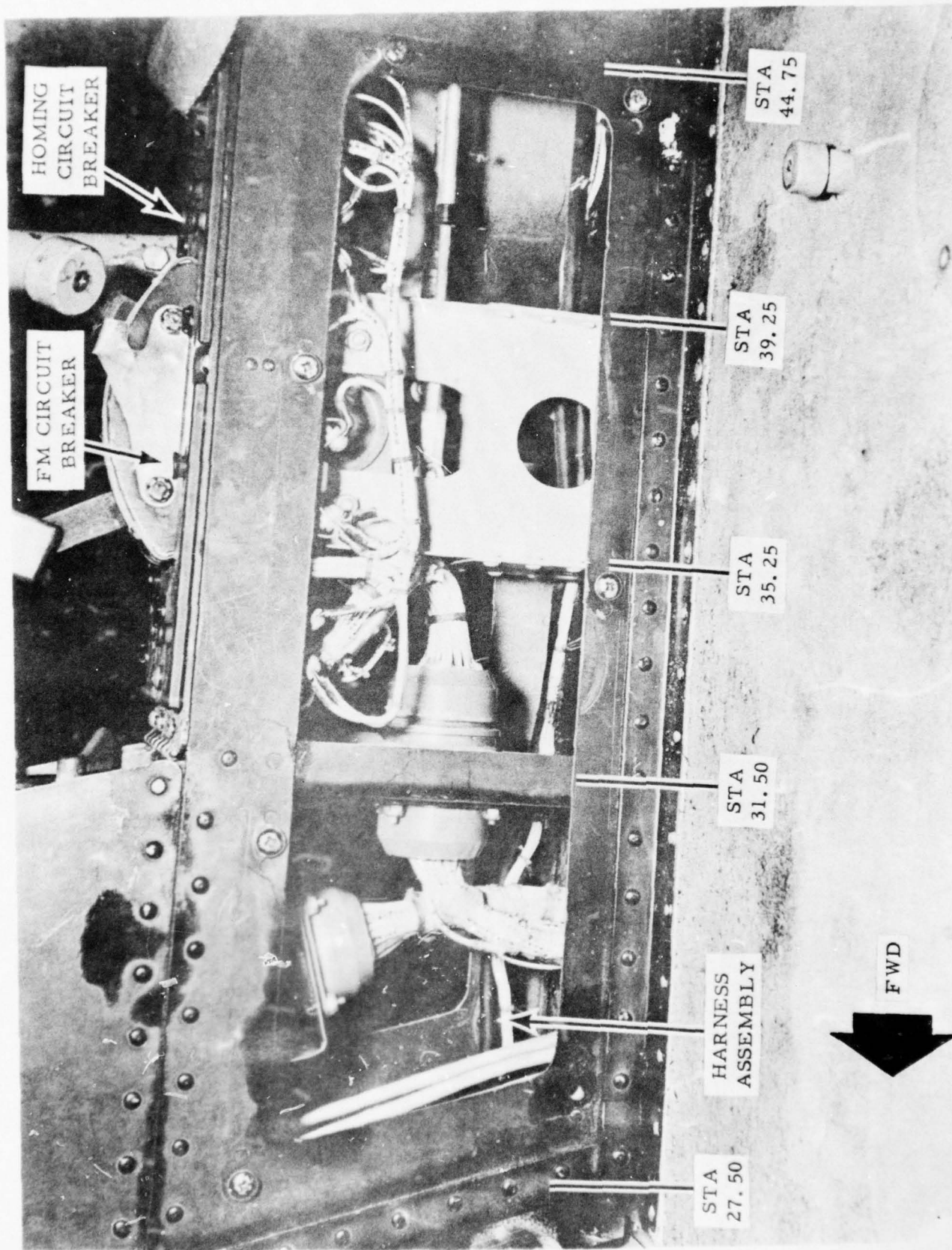


FIGURE I-7

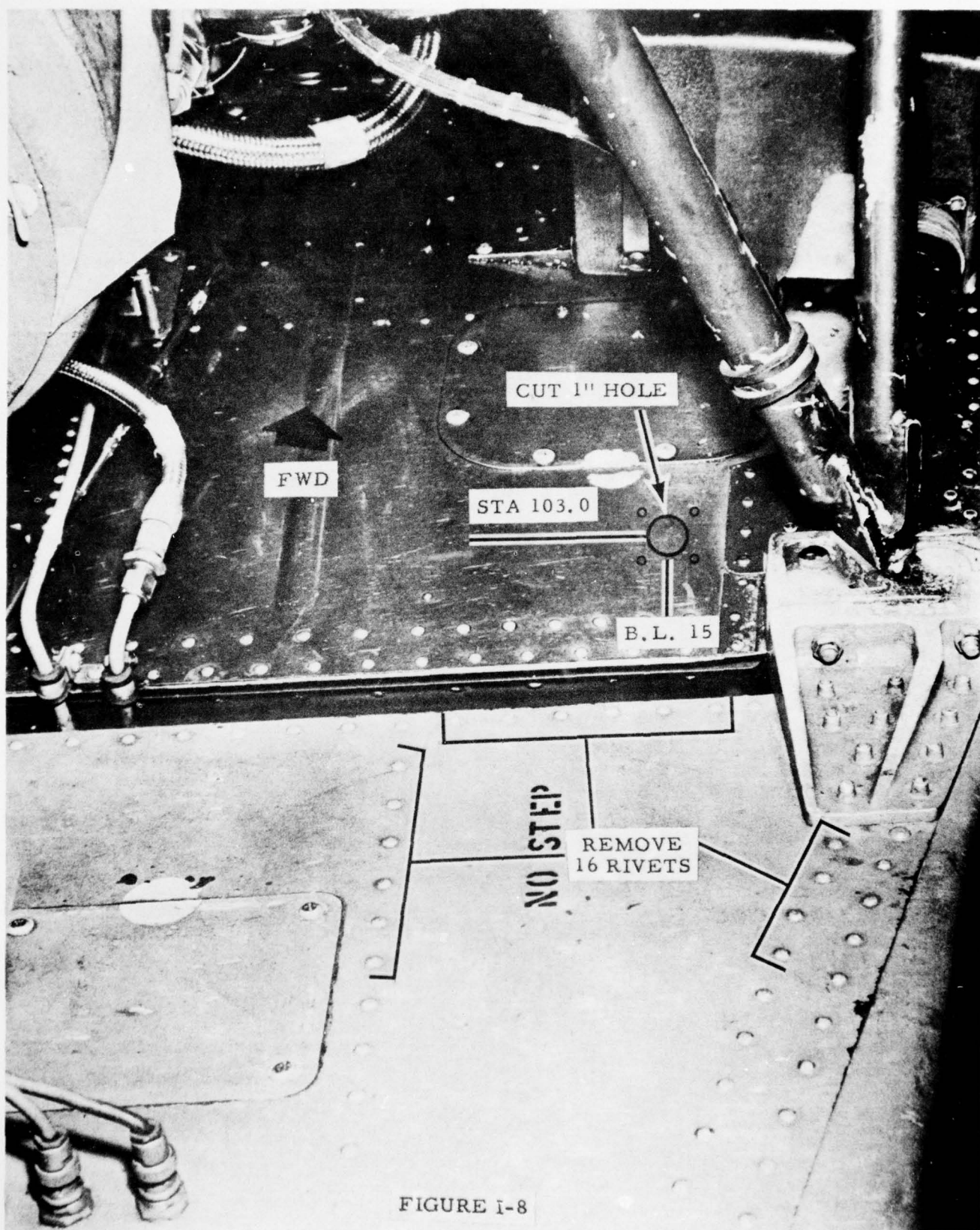
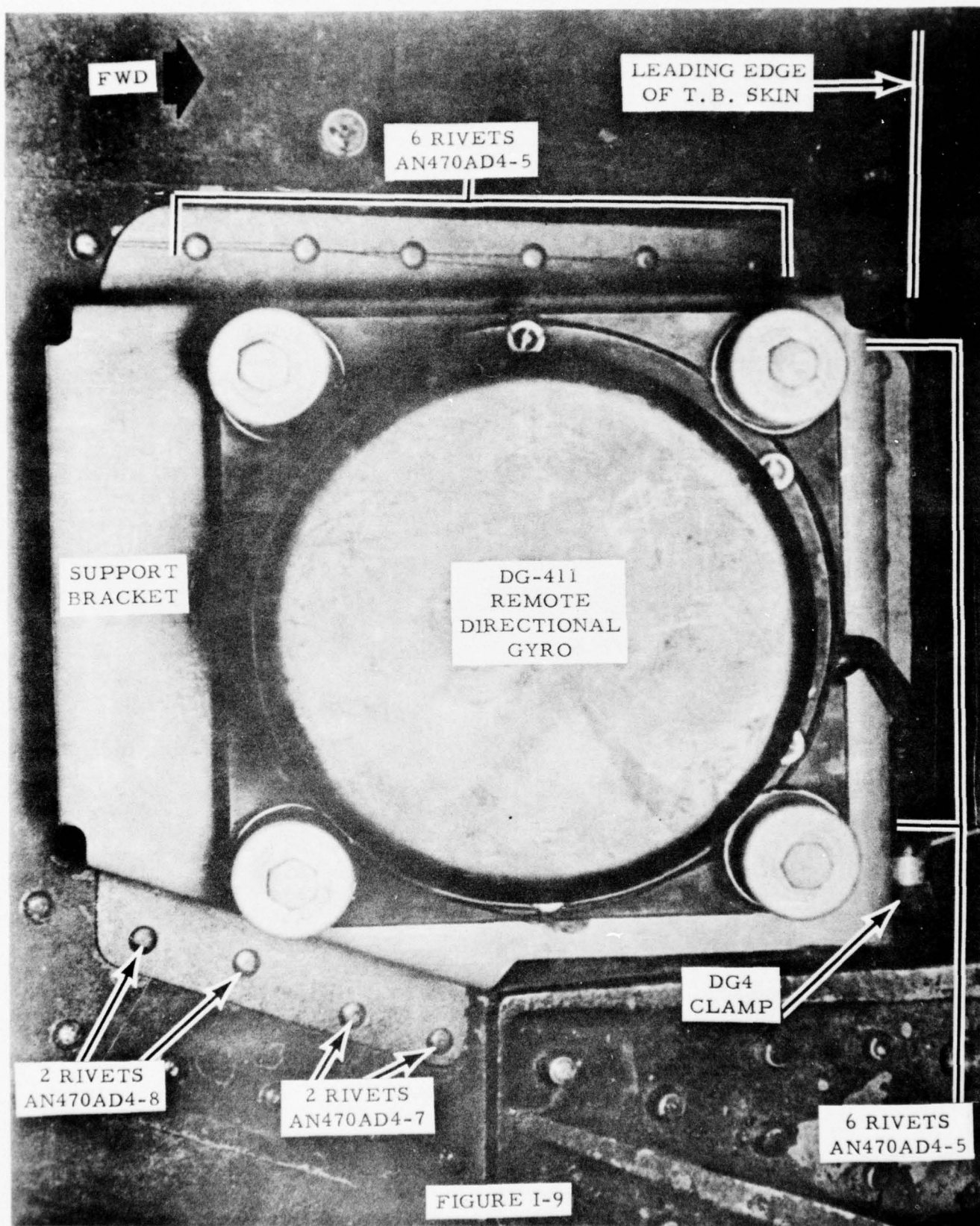
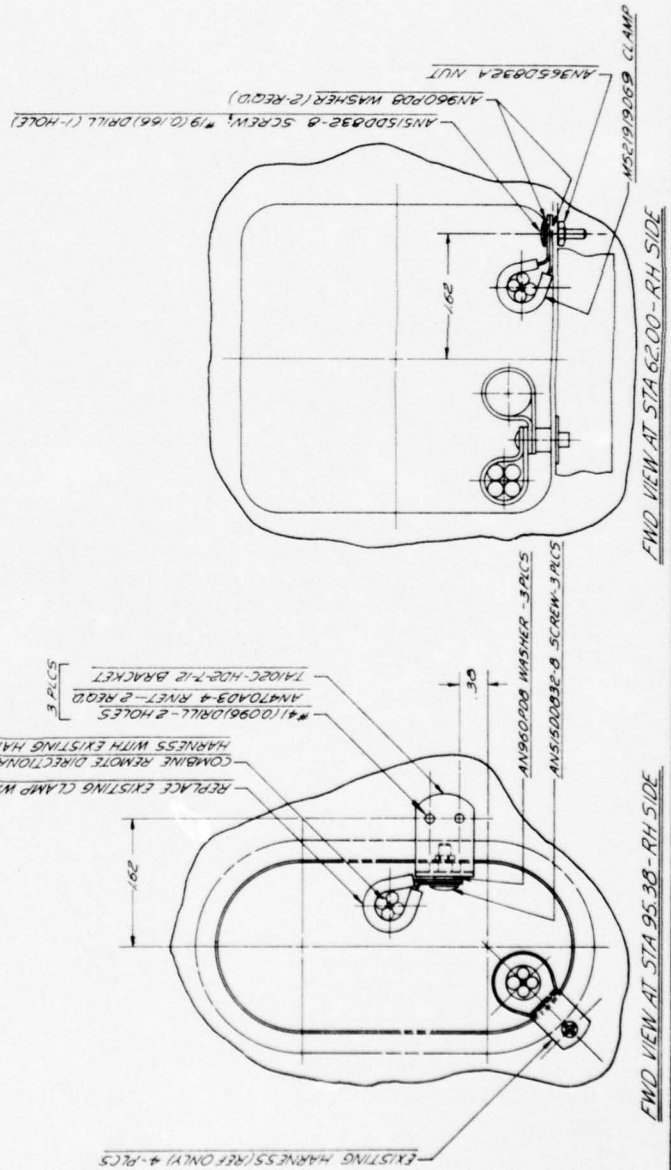
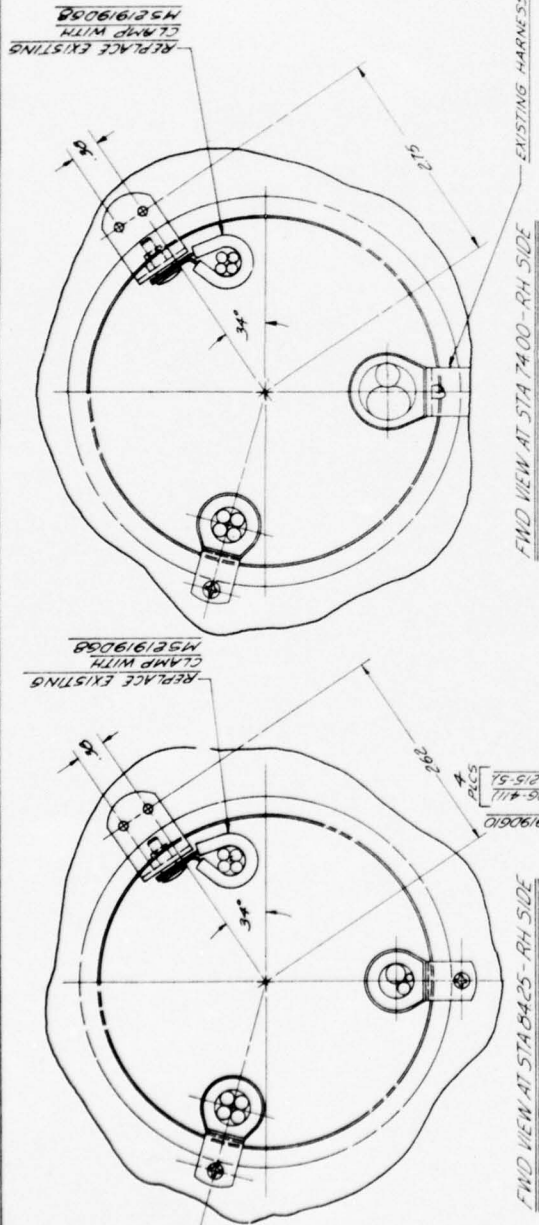


FIGURE I-8





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			UNITED STATES ARMY	
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			FORT RUCKER, ALABAMA	
			INSTALLATION OF HARNESS ASSEMBLY	
			(ITEM NO. 1)	
			AIRCRAFT TYPE: H-230	AIRCRAFT NO: 57-2242
			PREPARED BY: J.F.D.	DRAWN BY: J.F.D.
			CHECKED BY: J.F.D.	APPROVED: J.F.D.
			DATE: 14 NOV 68	PROJ NO: 29 68
				108 1-10

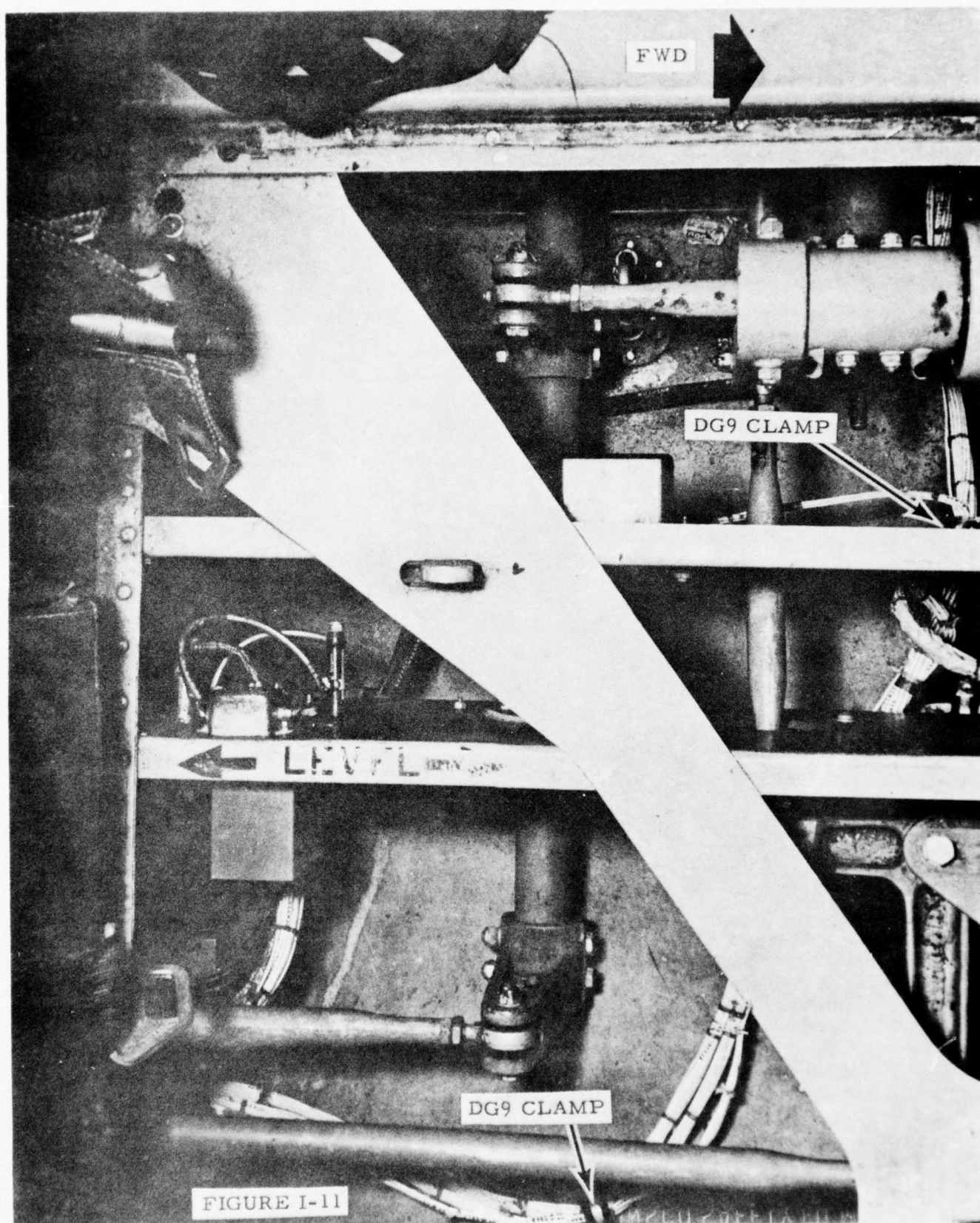
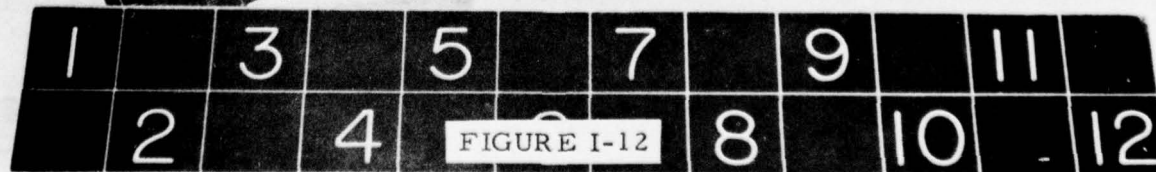
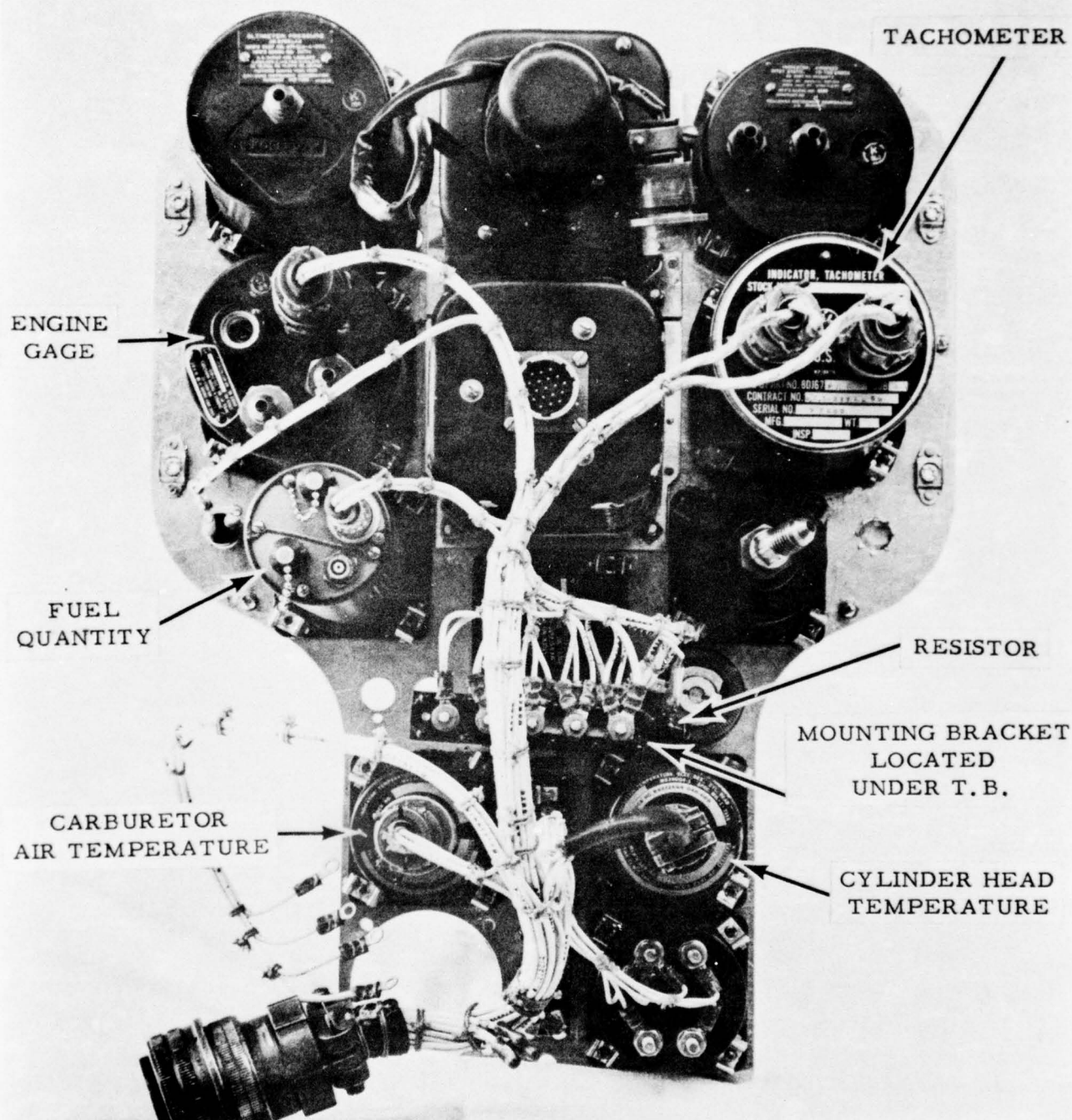


FIGURE I-11



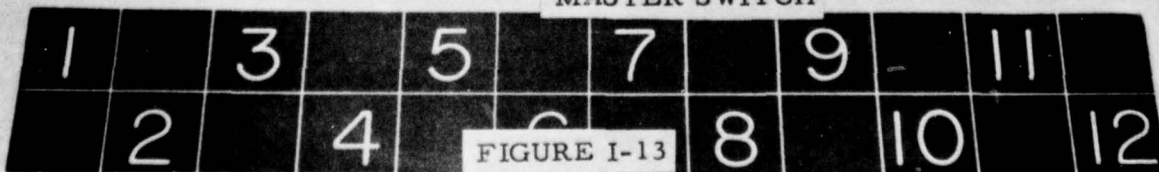
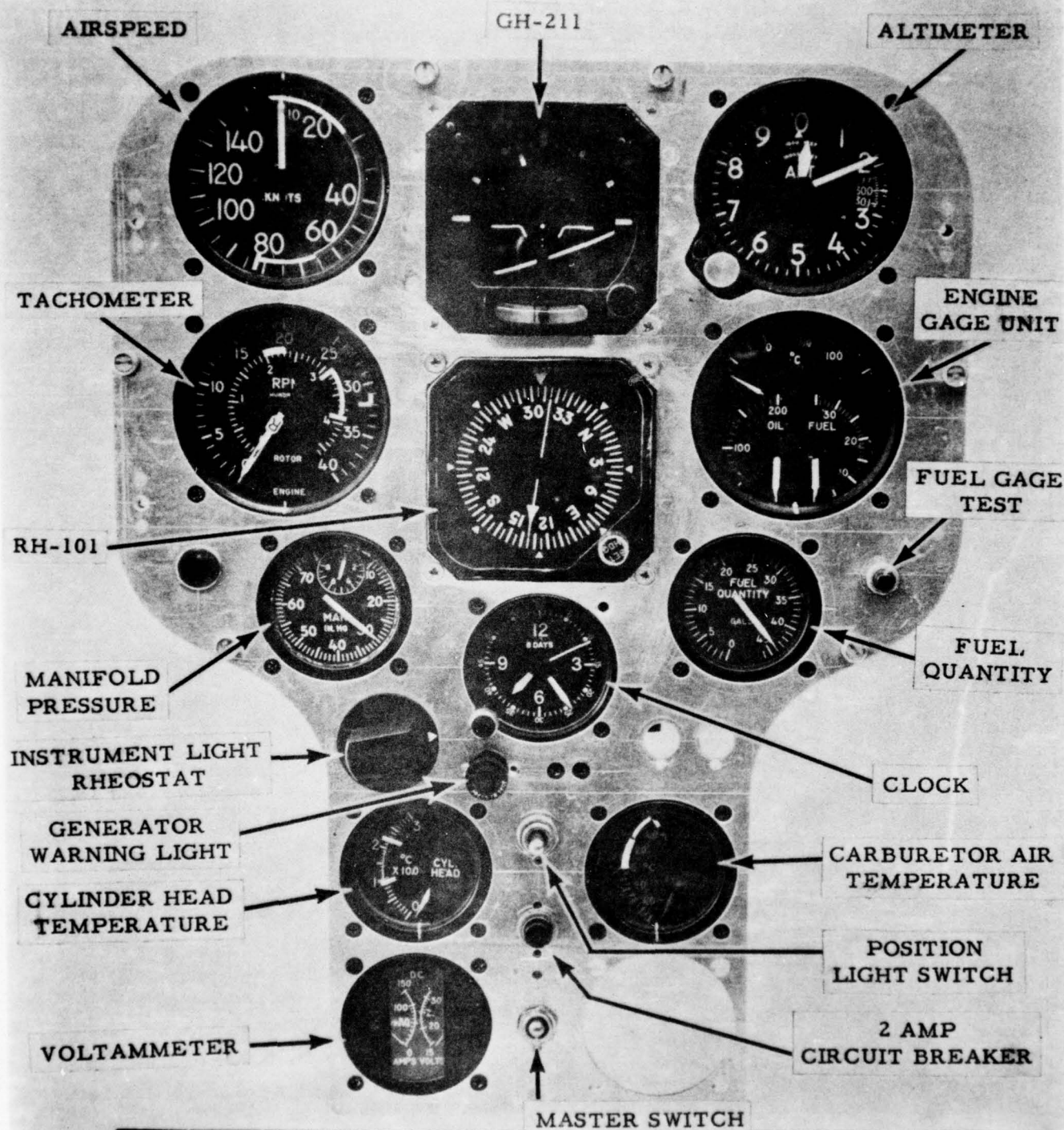
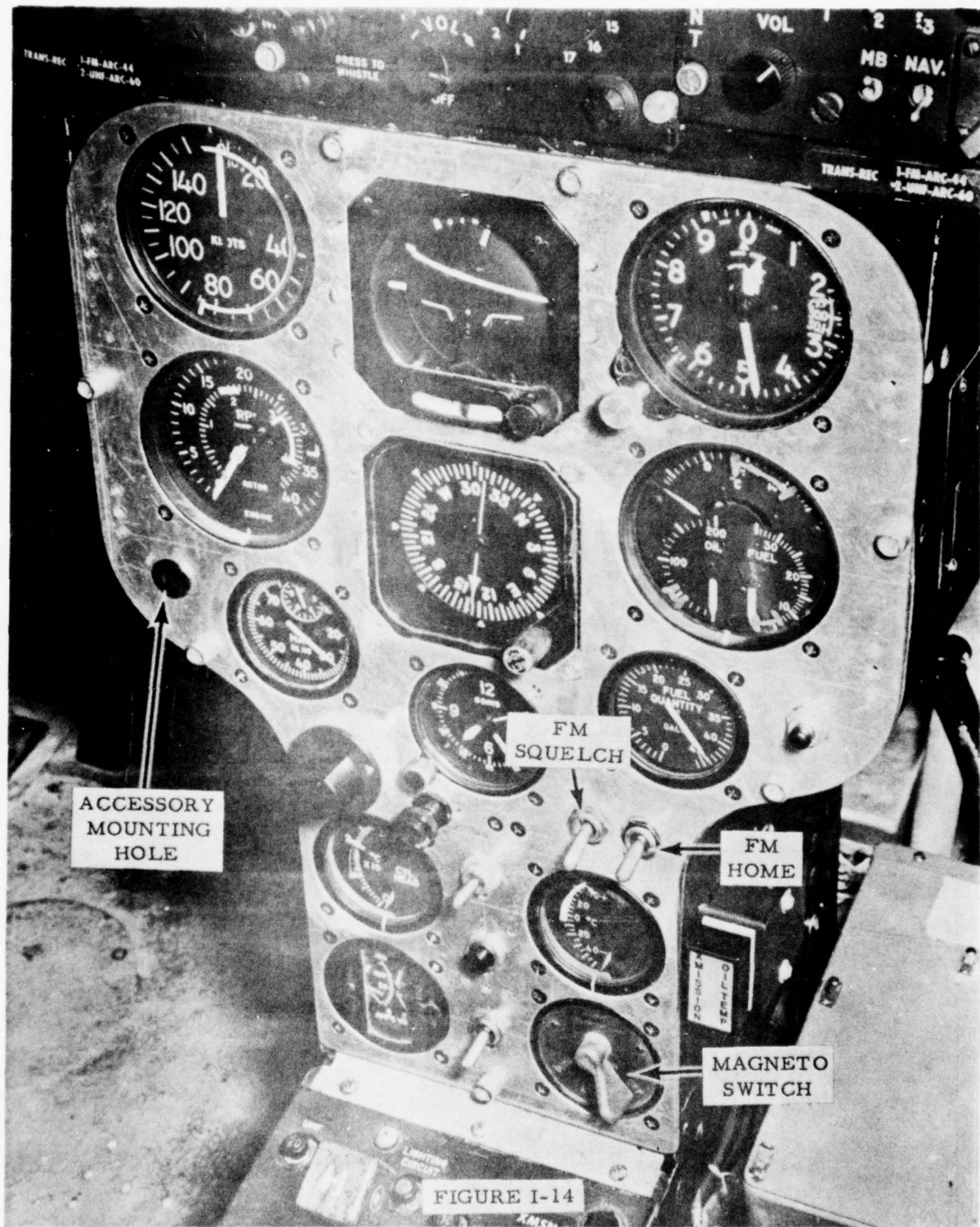


FIGURE I-13

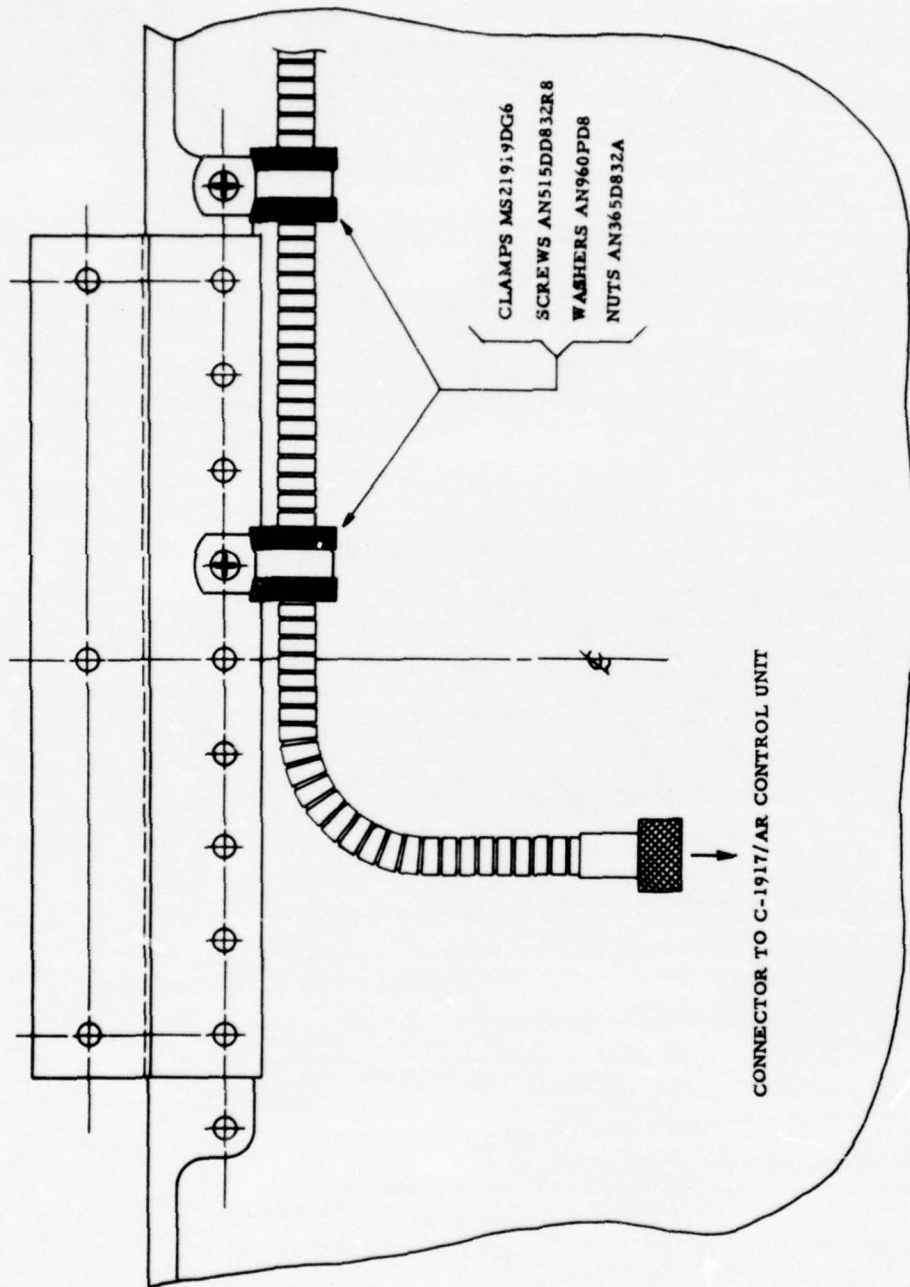




NOTE: ALL "REF" NOTATIONS REFER

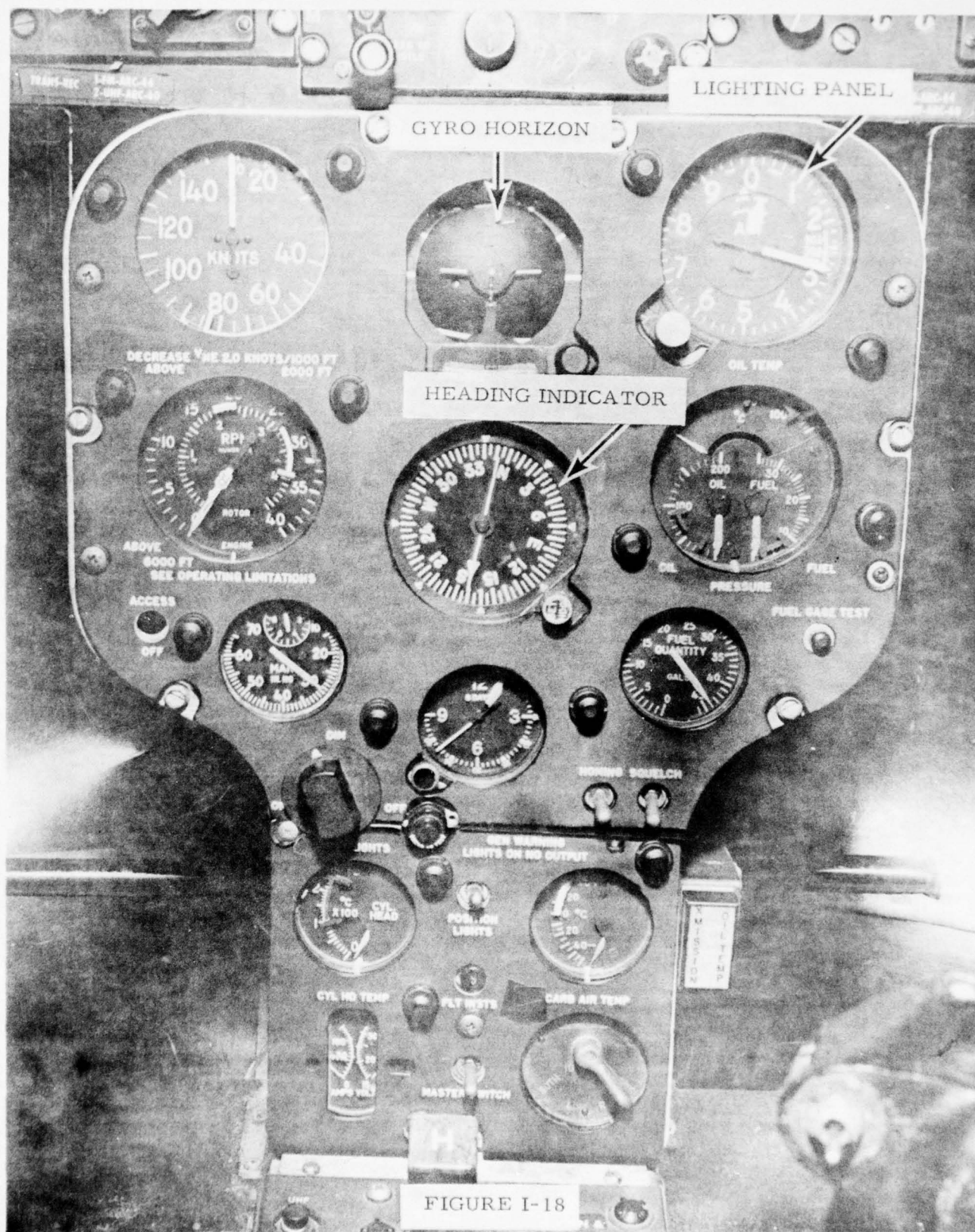
WE DATE	RE VERSION	DESIGNED BY	CHECKED BY
		UNITED STATES ARMY	
		SIGNAL BATTALION TEST AND SUPPORT ACTIVITY	
		FORT RUCKER, ALABAMA	
<p>WARMS DRAWING FOR H-200 INSTRUMENT PANEL</p>			
<p>APPROVED FOR RELEASE DATE 10-10-2000 BY 1045</p>		<p>APPROVED FOR RELEASE DATE 10-10-2000 BY 1045</p>	

▲
FORWARD



INSTRUMENT PEDESTAL
TOP VIEW

FIG I-17



APPENDIX II

ASSEMBLY INSTRUCTIONS FOR KIT, INSTALLATION OF ATTITUDE AND DIRECTIONAL INDICATORS IN OH-23D (H-23D) HELICOPTERS

1. Parts required per kit:

<u>Item</u> <u>No.</u>	<u>Federal Stock</u> <u>Number</u>	<u>Nomenclature or Description</u>	<u>Quantity</u> <u>(ea)</u>
* 1.	To be assigned (TBA)	Assembly, Harness	1
* 2.	TBA	Assembly, Harness	1
* 3.	TBA	Assembly, Harness	1
* 4.	TBA	Assembly, Harness	1
* 5.	TBA	Assembly, Harness	1
* 6.	TBA	Assembly, Harness	1
* 7.	TBA	Assembly, Harness	1
	4720-200-0414	Assembly, Hose, Flexible, AN6270-4-10	2
* 8.	TBA	Assembly, Instrument Panel	1
* 9.	TBA	Assembly, Support	1
* 10.	TBA	Bracket, Angle Support	1
* 11.	TBA	Bracket, Mounting	1
* 12.	TBA	Bracket, Mounting	1
* 13.	TBA	Bracket, Support	1
	NSN	Bracket, TA102C-HD2-7-12	

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
	6150-263-0654	Buss Bar, AN3433-2-3	2
	5925-713-8349	Circuit Breaker, 10 amp, MS24509-10	1
NSN		Circuit Breaker, 2 amp, MS25244-2	1
NSN		Clamp, Instrument Mounting (Aeroquip Corp., Los Angeles 64, California, Part No. 52981)	2
	5340-205-6300	Clamp, MS21919DG3	1
	5340-205-6301	Clamp, MS21919DG4	2
	5340-597-9514	Clamp, MS21919DG6	3
	5340-598-0592	Clamp, MS21919DG7	2
	5340-598-0597	Clamp, MS21919DG8	2
	5340-598-9864	Clamp, MS21919DG9	4
	5340-141-6999	Clamp, MS21919DG10	1
	5340-598-0208	Clamp, MS21919DG12	1
	5340-598-9803	Clamp, MS21919DG14	2
NSN		Cover, Terminal Block, 397-5	1
NSN		Cover, Terminal Block, 397-6	1
NSN		Cover, Terminal Block, 397-7	1
	4730-186-9951	Elbow, 45°, AN823-4D	1
	5325-249-6351	Grommet, AN931-8-13	1

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea)</u>
	5340-343-3452	Insulating Strip, AN3434-1	2
*14	TBA	Loose Wire Package	1
*15	TBA	Prototype Lighting Panel fabricated by Coastal Dynamics Corp, 219 Rose Ave., Venice Calif., Manufacturer Part No 29-62.	1
	5310-595-7443	Nut, AN365B632C	2
	5310-281-9845	Nut, AN365D440A	12
	5310-282-7843	Nut, AN365D832A	11
	5310-197-2320	Nut, AN365D1032A	4
	NSN	Receptacle, Dzus, PRB 3-1/2	2
	5320-117-6938	Rivet, AN426AD3-4	4
	5320-117-6941	Rivet, AN426AD3-7	10
	5320-117-6951	Rivet, AN426AD4-6	4
	5320-117-6814	Rivet, AN470AD3-3	2
	5320-117-6815	Rivet, AN470AD3-4	6
	5320-117-6826	Rivet, AN470AD4-4	24
	5320-117-6827	Rivet, AN470AD4-5	12
	5320-117-6828	Rivet, AN470AD4-6	2
	5320-117-6829	Rivet, AN470AD4-7	2
	5320-117-6830	Rivet, AN470AD4-8	2
	5305-144-3950	Screw, AN507B632R6	2
	NSN	Screw, AN507B832R20	8
	NSN	Screw, AN515DD440R6	12

<u>Item No.</u>	<u>Federal Stock Number</u>	<u>Nomenclature or Description</u>	<u>Quantity (ea.)</u>
	NSN	Screw, AN515DD832R8	14
*16	TBA	Shim	1
*17	TBA	Spacer	1
	NSN	Splice Connector, AMP No. 320559	5
	4730-279-0872	Tee Fitting, AN824-4D	1
	5940-500-8033	Terminal Block, AN3436-2-5	1
	5940-500-8036	Terminal Block, AN3436-2-7	1
	5310-187-2397	Washer, AN960PD4L	12
	5310-187-2371	Washer, AN960PD8	27
	5310-183-4406	Washer, AN960PD10	4
	5310-297-4043	Washer, AN961-6	2

*Non-standard items requiring fabrication by Depot or Contractor.

2. Fabrication instructions for non-standard items:

a. Fabricate Harness Assembly (Item 1) using Drawings II-1 and II-16 (I-15).

b. Fabricate Harness Assembly (Item 2) using Drawings II-2 and II-17 (I-16).

c. Fabricate Harness Assembly (Item 3) using Drawings II-3 and II-16 (I-15).

d. Fabricate Harness Assembly (Item 4) using Drawings II-4 and II-17 (I-16).

e. Fabricate Harness Assembly (Item 5) using Drawings II-5 and II-16 (I-15).

f. Fabricate Harness Assembly (Item 6) using Drawings II-6 and II-16 (I-15).

g. Fabricate Harness Assembly (Item 7) using Drawing II-7.

h. Fabricate Instrument Panel Assembly (Item 8) using Drawing II-8.

i. Fabricate Support Assembly (Item 9) using Drawing II-9.

j. Fabricate Angle Support Bracket (Item 10) using Drawing II-10.

k. Fabricate Mounting Bracket (Item 11) using Drawing II-11.

l. Fabricate Mounting Bracket (Item 12) using Drawing II-12.

m. Fabricate Support Bracket (Item 13) using Drawing II-13.

n. Fabricate Loose Wire Package (Item 14) using Drawing II-14.

o. Fabricate Shim (Item 16) and Spacer (Item 17) using Drawing II-15.

p. Fabricate lighting panel (Item 15) using Drawing II-18.

DRAWING II-1
FABRICATION OF HARNESS ASSEMBLY
(ITEM 1)

(BLUEPRINT ATTACHED)

DRAWING II-2

**FABRICATION OF HARNESS ASSEMBLY
(ITEM 2)**

(BLUEPRINT ATTACHED)

DRAWING II-3

**FABRICATION OF HARNESS ASSEMBLY
(ITEM 3)**

(BLUEPRINT ATTACHED)

DRAWING II-4

FABRICATION OF HARNESS ASSEMBLY
(INSTRUMENT PANEL)
(ITEM 4)

(BLUEPRINT ATTACHED)

DRAWING II-5

**FABRICATION OF HARNESS ASSEMBLY
(RH-101 HEADING INDICATOR)
(ITEM 5)**

(BLUEPRINT ATTACHED)

DRAWING II-6

FABRICATION OF HARNESS ASSEMBLY
(STATIC INVERTER)
(ITEM 6)

(BLUEPRINT ATTACHED)

DRAWING II-7

**FABRICATION OF HARNESS ASSEMBLY
(C-1917/AR (UHF) RADIO CONTROL UNIT)
(ITEM 7)**

(BLUEPRINT ATTACHED)

DRAWING II-8

INSTRUMENT PANEL ASSEMBLY FABRICATION
FOR OH-23D
(ITEM 8)

DRAWING II-9

**FABRICATION OF SUPPORT ASSEMBLY
(ITEM 9);**

(BLUEPRINT ATTACHED)

DRAWING II-10

FABRICATION OF ANGLE SUPPORT BRACKET
(ITEM 10)

(BLUEPRINT ATTACHED)

DRAWING II-11

FABRICATION OF MOUNTING BRACKET
(SI-111 INVERTER (STATIC))
(ITEM 11)

(BLUEPRINT ATTACHED)

DRAWING II-12

**FABRICATION OF MOUNTING BRACKET
(INSTRUMENT PANEL TERMINAL BLOCK)
(ITEM 12)**

(BLUEPRINT ATTACHED)

DRAWING II-13

**FABRICATION OF SUPPORT BRACKET
(DG-411 REMOTE DIRECTIONAL GYRO)
(ITEM 13)**

(BLUEPRINT ATTACHED)

DRAWING II-14

FABRICATION OF LOOSE WIRE PACKAGE
(ITEM 14)

(BLUEPRINT ATTACHED)

DRAWING II-15
FABRICATION OF SHIM (ITEM 16)
AND SPACER (ITEM 17)
(BLUEPRINT ATTACHED)

DRAWING II-16 (I-15)
WIRING DIAGRAM
ATTITUDE AND DIRECTIONAL INDICATORS
(BLUEPRINT ATTACHED)

DRAWING II-17 (I-16)
WIRING DIAGRAM FOR
OH-23D INSTRUMENT PANEL

(BLUEPRINT ATTACHED)

DRAWING II-18
FABRICATION OF LIGHTING PANEL
(ITEM 15)
(BLUEPRINT ATTACHED).

EQUIPMENT DISCREPANCIES AND SUGGESTED CHANGES

1. The receptacle (PT01E-12-10PW(SR)) on the "pigtail" harness attached to the GH-211 Gyro Horizon Indicator must be replaced with a connector (PT06E-12-10PW(SR)). Therefore, a receptacle (PT02E-12-10SW(SR)) will be required to mate with the connector (PT06E-12-10PW(SR)).
2. The "pigtail" harness attached to the GH-211 Gyro Horizon Indicator must have a minimum length of 15 inches in order to achieve ease-of-removal from the instrument panel.
3. The connector (PT06E-14-19P(SR)) on the "pigtail" harness attached to the DG-411 Remote Directional Gyro must be replaced with a waterproof (potted) connector (PT06P-14-19P) and mating receptacle (PT01E-14-19S(SR)) must be replaced by a receptacle (PT02E-14-19S(SR)) in order to comply with the written MWO instructions.
4. The "pigtail" harness attached to the DG-411 Remote Directional Gyro must maintain a length of 12 inches in order to complete the MWO satisfactorily.
5. The installation of the RH-101 Heading Indicator and the GH-211 Gyro Horizon Indicator must be accomplished by using a standard (ARINC) instrument mounting clamp (Part No. 52981, Aeroquip Corp., Los Angeles 64, California) in order to flushmount the indicators. It is suggested that the two indicators be modified to provide for bezel-type mounting (corner-hole).
6. The stud bolts used in the shockmounts of the DG-411 Remote Directional Gyro are unsatisfactory. It is suggested that these bolts be replaced by a more durable type of bolt to prevent the necessity of replacement (UER No. 3-62, submitted by USASATSA on 13 December 1962).
7. The inclinometer on the Sperry GH-211 Attitude Indicator can not be illuminated with the standard lighting source in the OH-23D. It is recommended that the inclinometer housing be modified to allow light from standard light source to enter the inclinometer.